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—EDITED BY—

F. J. S. GORGAS, M. D., D. D. S.

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ARTICLE I.

PLASTIC SURGERY OF THE FACE.

BY L. MCLANE TIFFANY, M. D.

(Delegate from Medical and Chiurgical Faculty of Maryland, and Professor of Surgery in the University of Maryland.

Gentlemen:—In the following remarks there will be no attempt made to present it in its entirety so large a subject as the one announced in the title, for to do so would require more time than the Association can spare and more wisdom than the writer can supply; the broad general principles which govern plastic facial surgery will be referred to, and then illustrated so far as may be proper by cases which have fallen under the writer's notice.

Plastic surgery of the face may well be, and usually is, divided into—

1st. Measures, for the restoration of parts congenitally at fault, either, from excess or deficiency.

2d. Measures for the restoration of parts deficient in consequence of accident or disease.

3d. Measures for the correction of deformity produced by cicatricial contraction; this last class being usually associated with the preceding, namely, an acquired deficiency of parts.

It is well to call attention to the fact that support must be afforded to transplanted skin, especially about the mouth; and here the assistance of a competent dentist is to be invoked whenever necessary.

A flap should be cut, so that its long diameter corresponds with the known direction of the blood vessels, and with advantage an arterial branch may be included. The shape must depend upon the gap to be filled, and inasmuch as there is decided shrinkage when skin is raised from its bed, the flap should be much larger in all directions than the space which it is designed to fill. Such, however, is not always possible, and a flap may be transplanted partly to unite at once and partly by granulation. A flap that is to granulate will require usually a pedicle more broad than one which is to unite at once, since in the former case the process of granulation is to be supplied by the pedicle alone, while the latter, certainly at the periphery, is aided by the neighboring tissue. Incisions are to be made where possible in natural furrows and under cover—*e. g.*, under the chin, that the resulting scar may escape observation. I have derived great advantage from the homely custom of cutting a pattern of the deficiency, placing the pattern on sound tissue, and with ink or iodine marking out my flap. Enough subcutaneous tissue should be raised with the skin to insure a good vascular supply. Wolf's plan of skin flap without subcutaneous tissue or pedicle, is still on trial, and will doubtless prove of limited application. No muscle should be included. Bevelling the skin, as suggested by Packard, may be of use occasionally. The surface to which the flap is to be transferred must be prepared by freshening the edges and cutting away all cicatricial tissue, unless resting on a cushion of thick connective tissue, and even here, where there is a thick cushion, granulation will occur, and not immediate union. Of course if the flap edge has been bevelled the edge of skin against which it is to rest must correspond. Scar tissue, if adherent to bone, is to be removed, and a movable edge made beyond. The transplanted skin becomes adherent by gradulation, and in accordance with the opinion already expressed such a flap is to be fashioned with a broad base.

A certain amount of hemorrhage is always met with during, as well as after, the separation of the flap, the first incisions are especially bloody, but a most excellent hæmostatic is to be found in hot water, either poured over the wound or applied by pressing cloths, previously wrung out in it, against the oozing surface. The temperature should be about 120°, which will not be uncomfortable for the operator's hand. Hot water offers the additional advantage of keeping the flap warm and pliable. Especially are ligatures to be avoided, since they are a source of irritation and prevent early union; pressure and tortion will usually obviate the necessity for their employment. Where oozing is persistent I do not hesitate to lay a few strands of silver wire beneath the lower edge of the flap, to avoid retention of blood, and make firm with cotton wadding and a bandage, removing the wire after a certain number of hours, depending upon the hemorrhage, moderating compression at the same time.

Dissecting flaps from either side and sliding them to meet over a cavity is a certain way to insure failure; where the line of union is supported from beneath success is attained, not otherwise; even the upper lip congenitally fissured gives an unseemly result when so treated, yet here there is partial support.

The use of this procedure (sliding parts together) should be restricted to closing gaps left by transfer of skin to more distant parts; in other words, is complimentary to the major operation. In order to facilitate the sliding of flaps lateral incisions are occasionally of assistance, but only when ample blood supply is at hand and scaring may be disregarded, acombination of circumstances found more often upon the body where habitually covered by clothing than upon the face. Transfer of skin with a pedicle is more often available. This latter, the pedicle, should lie flat, and if transfer is made from a distance, the intervening skin is to be cut so as to make a bed for it to occupy, thus assisting immediate union and giving nourishment to the distal part of the flap. Exceptionally only may a pedicle bridge intervening tissue, as in the Taliacotian operation for a lost nose; for usually it, the pedicle, is taken from the border of the deformity. So far as possible, a pedicle should not be twisted, but it is often unavoidable; by forming the base of the flap judiciously, however, twisting is reduced to a minimum, and thus proper circulation ensured. If it so happen that a twisted pedicle remains elevated and unsightly, it can be pared and made to lie smoothly, but this only after the flap has become well settled in its new situation and vascular connection with surrounding parts established. Sensation after transfer skin gradually become normal, although immediately after operation it may be greatly perverted. The raw surface left by transfer of flap demands but scant courtesy; it is in healthy tissues, so that all sorts of liberties can be taken with it. Usually the edges are very freely dissected up, slided the one towards the other and united by suture, so as to form a linear scar; should tension be great, complete approximation is not attempted, and the intervening space allowed to granulate. Granulating surfaces I powder with iodoform and cover with absorbent cotton, a dressing which has given, in my hands, results more satisfactory than any other. Such a dressing may remain in place for a number of days; where a small surface is so covered, the removal of the first dressing may expose a well-formed scar.

If a flap fail to unite throughout, and healing by granulation be necessary, I use the same dressing. Raw surfaces are to be held together by suture: and of the various kinds I prefer the interrupted of silver wire, passed with a straight needle, not claiming for it, however, any special advantages over others. The pin suture so frequently used in plastic surgery I employ rarely. Whatever the suture used, or however used, one thing is essential: "there must be no tension on the lips of the wound;" for if there is, the stitches cut out, leaving a ragged wound, which heals slowly, with an irregular scar.

Tension then is to be avoided by free cutting, very free indeed, and by one or more deep sutures tied over quills or buttons. Such sutures are passed deeply at some distance from the wound and not showing it at all, and are drawn tightly enough to place the flap edge lightly in opposition with the proper surface previously denuded. There is then no tendency for the raw surfaces to separate, and union takes place rapidly. This is the great requisite to success, and it is easy to see of what small importance is the kind of suture which immediately unites the wound edges provided they already rest in apposition without tension. Cases sometimes present themselves where from one cause or another it is impossible to achieve the desired result at once. A series of operations are then to be done, each one gaining a little until success is brought about. The time intervening between successive operations depends upon the exigencies of the case, and follows no rule. Roux's well known case may be quoted, as reported in Velpeau, where seven operations were done, and which succeeded to the satisfaction of the operator in the end. The extension of scar tissue through the agency of multiple small incisions is too well known to require more than passing mention, and the same may be said of the necessity of giving rest to parts after operation by preservation of a suitable position.

It is scarcely necessary to state that a plastic operation, be it ever so simple, should be undertaken only when the patient is in excellent health; preparatory treatment is to be carried out by regulating digestion putting the skin in order by baths, exercise, etc., etc., for while it is true that but one part of the body is operated upon, yet all parts must contribute to a cure.

Inasmuch as it is my habit to precede tedious operations by a hypodermic injection of morphine, during preparatory treatment, I investigate the patient's susceptibility to the drug—especially is this necessary in children. Cool weather will always be more pleasant for both patient and operator than warm, and as plastic surgery is rarely a matter of momentary necessity, summer, certainly in town, should not be chosen as the time for operation.

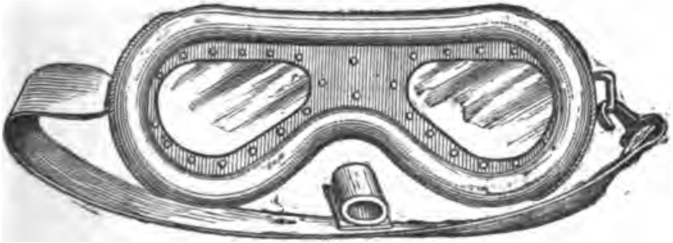
Operations about the mouth, and particularly inside the month, present to the surgeon the problem how to prevent blood necessarily drawn from flowing into the trachea, and so asphyxiating the patient. Prior to the discovery of anæsthesia operations upon the mouth were undertaken with the patient seated, the head leaning somewhat forward, that the blood might escape through the lips; but as the erect position is imcompatible with ether or chloroform narcosis, an essential to operations at present, a provisional tracheotomy combined with some sort of pharyngeal occlusion is generally adopted. This permits the patient to keep the supine position during anæsthesia without fear of blood entering the air passages. But a tracheotomy is always a a complication to be avoided if possible, and so I have in a number of cases performed bloody operations of one kind or other about the mouth as follows: The patient receives a full dose of morphine hypodermically, and one-half hour later anæsthesia is induced (I have already referred, under the head of preparatory treatment to the necessity of finding out how morphine is borne by the patient) less than half an hour too much excitement. The patient is then turned face downwards, the thorax projecting beyond the edge of the table an assistant at each shoulder supports the upper parts of the body, and one standing behind the shoulder supports the head directing the face towards a window. The month is thus lower than the larynx and blood flows downwards and forwards from between the lips into a proper vessel, not back into trachea. I have removed from a patient in this position so much of the upper jaw as was bounded by the left central incisor and right posterior molar, opening both nostrils, yet no interruption from hemorrhage occurred. The surgeon is obliged to operate either kneeling or seated unless the table be of exceptional height.

ARTICLE II.

A NEW INVENTION USEFUL TO DENTIST'S WORKING CONTINUOUS GUM AND PLATE WORK.

INVENTED BY DR. GENESE, CLINICAL INSTRUCTOR DENTAL DEPARTMENT UNIVERSITY OF MARYLAND.

It consists of an eye-guard which can be made air-tight for those working in the Chemical Laboratory, and ventilating for working at the gum furnace, and plate work, platina melting and assaying. In the first-mentioned work it is impossible for fumes of acids, smoke or dust to reach the eyes, and when using it with the ventilating tubes open, it is still air-tight around the orbital surface, while the air has to pass some distance through tubes, making it impossible for the eyes to get injured by the glare of flame and heat of the glowing charcoal while soldering and the gas emitted therefrom which is so injurious to the eyes.



It is a non-conductor of heat, and therefore valuable at the furnace to enable the dentist to examine the work in the muffle closer and without discomfort.

It is light and comfortable, and does not distress the wearer like ordinary goggles or glasses hitherto used for that purpose of protection.

Mica being used for the lenses, gives a softer light without altering the focus of sight like glasses, no condensation takes place. Breaking is impossible from change of temperature, and they can be bent in any form without injury.

The ventilating is accomplished through the tubes forming the fastenings, which are composed of a hollow tube bent and soldered to the frame, the distal end is pierced with fine holes to pass air and can be made air-tight by plugging the inner hole which passes through the frame to the inside.

The wood cut shows the entire instrument and a section of the rubber tube.

The frame is composed of pure lead stamped to an inner and outer frame, with edge up.

The mica is the size of the inner frame, and is secured by a double layer of rubber cement riveted and then hermetically sealed by soldering the frames at the edges by this process, the frames forms a box in which to lay the pad, which is a tube of rubber inflated and made in one piece on a flat band (and vulcanized in steel moulds.) This band and tube is again cemented to the frame and the outer and inner edge milled over the band projecting from the tube of which a section is shown in the engraving. It is adjusted to the head by a broad rubber band and hook.

May be obtained at all Dental Depots.

ARTICLE III.

PHOSPHATE OF LIME AND THE TEETH.

BY PROF. C. M. WRIGHT, D. D. S.

(Read at the Fortieth Annual Meeting of the Mississippi Valley Association of Dental Surgeons.)

The dentist who is fond of study, and who can take pleasure in his library, should be glad that he is alive to-day; for he need never have *ennui.* He can, at any spare moment, or during the intervals of dreary labor for daily bread, turn his attention to any of the many fields now open to his mind, and wander therein to his heart's content;

finding on every side interesting curiosities and unsolved riddles, the solution of which promises so many benefits to mankind. Even if he cannot, or will not, throw off his coat and take hold boldly and patiently with the enthusiastic workers in any particular field, and is content simply to walk through, looking on at the work as it progresses, his mind will be refreshed by the view, his interest must be unchained, and, by reflex action, his happiness will be increased. If he enters the field marked, " Etiology of Dental Caries," and follows the distinguished and busy laborers (with Miller now at the head, and some noble veterans, who have done splendid work in the past, wiping the sweat from their brows as they, too, rest for a moment to look on with satisfied expectancy at the younger men), he cannot but be deeply interested and benefitted by the knowledge that he will gain of the potent effects of certain acids upon tooth enamel and dentine; of the wonderful parts played by peculiar microscopic fungi upon decalcified tissue; of the possibility of inflammatory changes in the living tissues, and of the curiosities of the minute anatomical structures now more fully revealed than ever before.

If he extends his rambles into the fields of Biology and Embryology, and follows the experiments of the laborers here, in their diligent efforts to unveil the mysteries that envelop Protoplasm, and the advances made in the attempts to sharply define the delicate unfoldings and duplications of the embryonic sheets of the germ capsule, after its unaccountable verification from the churning together of femenoid and masculoid elements, he cannot fail to be impressed. If he considers himself a " practical man," he will nevertheless become convinced, after proper meditation, of the possibilities of all this cultivation of these curious fields, in bringing forth crops of real knowledge—" the knowledge which a man can use "—" the knowledge which has life and growth in it, and converts itself into practical power."

If the dentist's taste do not encourage him to enter these fields, either as a laborer or spectator, he can turn his attenlime, during pregnancy and lactation, will "very likely prove beneficial to the teeth of the children;" also, "that in many cases where the phosphates fail to be assimilated from the natural food, they do seem to be from other sources."

He believes that we are justified by experience and observation in attempting "to supply, by artificial means, or by especially prepared foods, the elements which fail to be assimilated in the ordinary way." Just here I should like to say, in reference to the opinions of Dr. Cushing, and of the others whose opinions I shall take the liberty of using, that we dare not despise, careful clinical observations, even if they should prove to be at variance with pathological laboratory observation, or, at least, not substantiated by laboratory research. Both should go, hand in hand, and where they seem at variance a more careful reconsideration of all the observations should be made.

Austin Flint has recently impressed upon the medical world the importance of the clinical study of diseases as a safeguard against errors arising from exclusive attention to histological researches. The question of food, in health and disease, is not a new one; but its importance is increasing as our knowledge of physiology increases.

The value of certain kinds of food in excess, in certain diseases, and the necessity for a particular reduction of the daily amount of certain other kinds of food in certain other diseases, is recognized by medical men. The careful classification of the ingredients of the body, and of the ingredients of foods, is the work of the physiological chemist; and the physician or dentist who can best recognize the *demands* of the tissues of the body, for certain qualities and quantities of food, serves best the interests of mankind.

The dental profession has, for many years, through the influence of individual dentists of positive convictions, urgently recommended the employment of bread which has not been deprived of its phosphates by too much grinding or bolting of the grain.

Dr. John Allen, of New York, has long been an apostle in this work.

Prof. Luther Shepard, of Boston, read an article before the Odontological Society of New York, in December, 1875, on "Food in its Relation to the Teeth." In it is presented the history of a case that had been under observation for several years, in which the teeth, which "were very soft," gradually became "hard and dense," so that "instruments cut with difficulty, and gave out the peculiar, sharp, high tone, so familiar to us, as indicative of well-formed dentine." Prof. Shepard had advised the daily use of oat meal as an article of diet, in addition to the regular mixed diet found on all tables. The patient conscientiously adhered to the prescribed diet, consuming "a saucer of oat-meal twice daily." While admitting "that other causes have, doubtless, contributed their quota to the general result," Prof. Shepard insists that these other causes must "occupy a second place in the production of the result, the patient's general health having undergone no improvement, and no special care beyond what other boys can be induced to take of their teeth having been taken in this case.

In the discussion, which followed the reading of this paper, Prof. Flagg, of Philadelphia, introduced a similar case of marked improvement in the quality of the teeth from the use of oat-meal, cracked wheat, and other such preparations, and gave assent to the general proposition that diet can influence the tooth structure in early life.

Prof. Pierce claimed to have seen a marked improvement in the quality of the teeth, affirming that they had "grown more *dense*" from the use of chalk topically applied, *i. e.*, "rubbed in between the interstices of the teeth upon the gums before going to bed." Prof. Pierce does not explain whether the result was accomplished by a new process of nutrition, by *direct feeding* to the tissue, and appropriation by the tissue without the necessity for the tiresome routine generally required of food—of passing into the stomach, undergoing uncomfortable metamorphoses, and working its way into the blood, and thence to remote tissues, or not. Still, the observation may be accepted, that teeth *do* become denser without the addition of oat-meal, and from some other and mysterious causes.*

Prof. Hamilton, of the medical profession of New York, who was present at this meeting of the Odontological Society, said that he had in common with other medical men, given some attention to the destruction of the teeth by materials taken into the mouth, but not to the question of the influence of special diet in improving the quality; but was inclined to the belief that it makes but little difference whether we use oat-meal, potatoes, or beef, provided that what we do eat is properly assimilated; claiming "that the human system is not a crucible, or a barometer," saying "we cannot make a general rule, that we can add to the organism a certain amount of the phosphates by putting a certain amount into the mouth. The amount of phosphates to be used by the system will depend upon the digestion."

I have quoted these reports to show that even in this field that appears so near, and so easy to cultivate, there is much more careful work to be done than has yet been given to it, if we would get even a few sound maxims out of it.

Dr. E. C. Kirk has presented some facts of importance on this subject in a paper published in the *Iudependent Practitioner* for January, 1884. He details observations

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*As we have a multitude of observations of this same thing, found anywhere in the floating literature of the dental profession, the question might be asked: How does this happen? It is possible that the thorough and constant employment of any such an acid, or cleansing, or antiseptic means as are so frequently recommended, such as soap suds, chalk, carbolic acid, &c., &c, may, by preventing fermentation and the formation of destructive acid, or, by acting as parasiticides in the immediate neighborhood of tooth-tissue, *induce* by the *absence* of deleterious acids, a deposit of the mineral elements in tooth-tissue from the general circulation, making soft teeth become dense and hard under the soap suds and chalk stimulate the living matter in the dentinal tubes to supply the so-called dentine of repair, as certain things are said to make hens lay eggs?

made upon the teeth of the pupils of the Pennsylvania Institution for the Deaf and Dumb. Dr. Kirk, having had charge of the *mouths* of the three or four hundred children of this Institution, and appreciating the opportunity of observing the influence of a fixed and special diet upon the teeth of such a number of pupils, has tried to give a reliable data. He has given the diet table, approved March 1st, 1882, for breakfast, dinner and supper, for each day of the week. I shall not take up your time by quoting the table. rather referring you to a more careful study of Dr. Kirk's article, but will only say that, considering that the Institution is a charitable one, the bill of fare is excellent, not only as regards liberality in quantity, but variety and selection. A half pint of milk, bread, and butter, are the staple articles for breakfast for every day, while eggs, Indian mush, oatmeal porridge, or grits, are alternately afforded for certain days. For dinner—roasts of mutton and beef, steaks, fish, and soup follow each other, according to the day of the week, with potatoes, beans, beets or turnips, onions, etc., corn starch, tapioca, bread pudding, etc., to make out the different day's fares. For supper—half a pint of milk, bread and butter as regular articles, with either stewed fruit, cottage cheese, molasses, and ginger cakes as the varying articles.

The children coming to this Institution are mostly from the poorer classes, and are not generally in well fed conditions. Their teeth present the varieties of indifferent and poor qualities that we find among badly nourished children. Dr. Kirk has observed a decided improvement in the *density* of the teeth in the course of one year after entering the Institution. He says in regard to the improved teeth; "They will be found exceeding hard and dense, making the wear and tear on cutting instruments very great. Excavators and chisels have to be tempered to the point of brittleness to be effective in preparing cavities; otherwise they will not cut the extremely hard structure." This is, he claims, the "result of repeated tests and observations carefully made." And he says: "But the most conclusive evidence which I have met with of the value of their table diet, so far as the nutrition of their teeth is concerned is the unusual number of cases of arrested caries, and the formation of the so-called secondary dentine." It is to be remembered that the grits, oat-meal, and Indian meal for breakfast were added to the diet for the express purpose of improving the quality of the teeth. (I do not know whether upon Dr. Kirks advice or not.)

Now, from what I have here quoted and for other reasons, I think we are safe in believing that the dental profession accept as plausible and possible, the idea that the *density* of tooth tissues can be increased by proper or special nutrition during the period of early development and during childhood, and that an *excess* of the phosphate of lime in the food, or administered in preparations (just as cod-liver oil, for instance, is, in pulmonary diseases; or, iron preparations in ænemic conditions, *may* be as beneficial to the teeth, as it is believed to be to the osseous system at this period. It is also a generally accepted idea as belief in the profession, that teeth may deteriorate in quality, owing to a lack of these phosphates, in the food at any period of life. It is believed that the teeth of females, during gestation and lactation, are deprived of phosphate of lime for the benefits of the bones and teeth of the fœtus or child. There seems to be no question in the minds of the profession on this point, that phosphate of lime is directly abstracted from the tissue of the teeth of the mother to be used in the development of the bones of the growing fœtus. And it is believed generally that the mineral salts leave the teeth in some diseases of middle life, as in nervous affections, and in wasting diseases from decreased nutrition. Can we say, however, that *enamel* is subject to important retrograde and constructive changes within observable limits, dependent upon food or nutrition? Can we say that *enamel* that is firm and resistant to acids this year, may be soft and non-resistant next year, owing to a non-appropriation of phosphate of lime during the year? Are we scientifically certain that it is the phosphate of lime that is the varying ingredient? Accepting the chemical operation of an improvement in density in children's teeth, from some cause or other, would it not be well to have laboratory observations based on careful chemical analysis and histological examinations? Chemical analysis of a tooth extracted during the time of faulty nutrition, in childhood or in pregnant female, should show a lack of phosphate of lime, while a tooth from the same patient after improved diet or the administration of phosphate of lime, should show a larger proportion of this ingredient; or an analysis of the different tissues of a *dense* tooth should be made, and the patient then deprived, as far as possible, of phosphates in the food for a time, and an analysis for another tooth should be made. This experiment could be made on dogs and cats. Until we can bring these things into a scale, we are simply guessing. Until we can make satisfactory physiological and chemical experiments, noting accurately the quantity of the phosphate in the ingesta, and the quantity of waste disposed of in the urine, feces and perspiration, and can satisfactorily account for the disposition by analysis of the dentine and enamel, etc, how can we say positively, even with our stock of chemical knowledge, that the phosphate of lime in grits, or cracked wheat, or in the syrup of lacto-phosphate of lime, actually goes into the tissues of the teeth? Is it not all supposition on our part, or is it not rather simply deduced from the fact that enamel contains say 855 parts in a thousand of phosphate of lime, and dentine about 643 parts in one thousand; that phosphate of lime is the most important (next to water) of the inorganic constituents of the body; that it exists in a solid form in the teeth and bones, united with the animal matter? Why have we not pitched upon water as the varying ingredient for the same reasons? There is no part, to be sure, of the body which does not contain, or does not yield upon incineration, phosphate of lime. It has been *said* that the bones of animals soften if the animals are fed upon food deficient in this ingredient. It has been *said* that fractures of the bones of pregnant women do not readily unite owing to a lack of the phosphates. It has been found that during continuous mental labor the amount of the phosphate of lime is diminished in the urine, from which has been deduced that it has some connection with nervous activity. Dusant claims that it accumulates wherever tissue changes are rapidly taking place. It is believed to have the property of aiding constructive metamorphosis. Prof. Cassidy, in a paper read before the Cincinnati Dental Society a month or two ago, but which I have not seen in print, and, therefore, cannot quote from, suggested the possibility of a relation between the increase of the nervous diseases of to-day (neurasthenia, etc.), and the elimentation of important nitrogenous elements from our grain food by fine grinding and bolting of the meal. We are informed by those who have studied the development of enamel, dentine, and cement that imperfectly developed enamel continues imperfect; that dentine becomes denser during life by age; that there is a "dentine of repair" occurring at the peripheral ends of the dentinal tubes, nearest to points of irritation, but have we *proofs* that changes in the amount of phosphate of lime take place to and fro, now less, now more, according to the amount taken into the stomach? What might be the proper course for us as practical men to do, if this is proved to be the case?

I have a suggestion to make, based on the floating opinions in the profession, the soundness of which I shall leave to you. It is this: Feed your pregnant women with the best preparations of the phosphates; flood them with phosphates during gestation and lactation; flood the children after they appear with phosphates. until by examination with excavators and chisels you find the enamel and dentine as dense as you could desire, then destroy the pulps of all the teeth, to *prevent* deterioration from any possible lack of this element, or from possible impairment of nutrition in after life!! If this suggestion shocks you, I ask, is it not as reasonable as some theories of specific methods of feeding? And have we not as many instances of the saving of teeth by this method—not, indeed, undertaken with this grand (!) idea in view, but accidently, as can be produced in favor of the feeding process?

Now, having raised as many questions as I can in a paper of this kind, questions, by the way, which I cannot answer, but which may be of importance as showing what a fine field for work this "practical" one offers, I beg to say in conclusion, that personally, I must add that my own empirical (clinical) observations favor the employment of the preparations of the, phosphates for *children*. I have tried them for years, in dozens of recorded cases, and must acknowlecge that in some way or another, the result has been as satisfactory as the administration of any remedy for any disease. Children have behaved as though under the influence of a regularly administered tonic. Pale children have acquired color in their cheeks. Listless children have waked to new energy. Flabby children have acquired firmer muscles, and dental caries has been checked to a degree noticeable to parents as well as to myself. I have not believed that the phosphates were simply taken up and deposited in the teeth, but could not fail to observe *general* beneficial results, though unable to fully account for the modus operandi. I have administered it as Dr. Cushing recommends, as the syrup of lacto-phosphate of lime, given daily for a month in tablespoonful doses and discontinued for a month, and so on. I do not know but that a bit of breakfast bacon, or a small piece of juicy beefsteak, every morning, if agreeable to the taste of the child, might furnish just the right quantity, or just the right excess of ingredients, necessary to produce all the beneficial effects noticed from the syrup. I do not know, also, whether the eating of grits and oatmeal in *adult* life, if assimilation is good, may not be as injurious, and have in its train diseases as serious as those which follow the excess of nitrogenous substances. Certainly, if it is as active an agent as we are led to believe by our reported observations on the teeth, it must play an important role in other tissues, not so easily observed, and we cannot define it to comfortable normal deposits in dentine.—*Ohio State Journal of Dental Science.*

ARTICLE IV.

ON THE INFLUENCE OF MICRO-ORGANISMS IN THE PRODUCTION OF CARIES.

BY ARTHUR S. UNDERWOOD, M. R. C. S., L. D. S. ENG.

(Lecturer on Dental Anatomy and Physiology at the Dental Hospital of London Medical School, &c.)

Mr. President and Gentlemen:—Mr. Miles and myself have so much to lay before you to-night, in the form of evidence concerning the part played by Micro-Organisms in the Production of Caries, that we feel confident you will excuse us if we go straight to the matter in hand without an unnecessary waste of time in the form of preamble.

It is, however, necessary to state that we only propose to discuss the purely pathological side of the question to-night, and that only so far as the dentine alone is affected.

As we stated in 1881, we still consider that the initial stage, that is, the enamel destruction, is probably little more than a chemical solution of the tissue by an acid or acids; but we are inclined to believe that the greater part of such acids are the result of fermentation, a process which is entirely dependent upon micro-organic life, as has been amply proved by Pasteur, Lister, and others.

As the result of the decomposition of albumenoids, numerous substances are formed in the mouth—peptones and other similar bodies, fatty acids, acetic, formic, butyric-malic, lactic acid, etc., and in some cases sulphuretted hydrogen and ammonia, are produced in large quantities. This decomposition is directly produced by the vegetation of micro-organisms.

A very simple illustration of this fact is obtained by filling two bottles with neutral saliva and bread, and rendering one aseptic, either by adding carbolic acid or boiling, or any other process of the kind. The micro-organic growth which will take place in the impure one will produce a large quantity of acid; the pure one will remain neutral. The most constant source of an acid reaction in the mouth is undoubtedly micro-organic fermentation.

This is not, however, the main subject of to-day's paper, and therefore we shall content ourselves with this passing allusion to it.

We cannot, however, refrain from expressing our gratification at the careful attention this subject has received from the profession, both here, in America, and on the Continent. Prof. Mayr has worked out the chemical aspect of the question with great care and exactness; Mr. Tomes has done much in the direction of the effects of organisms in the soft tissues of the teeth; Mr. Spence Bate has given us many valuable suggestions in his able and exhaustive summary of Dental Science at Plymouth last year; Mr. Sewill has thrown out valuable conjectures upon the remote etiology of caries; and Dr. Miller, of Berlin, has done an immense amount of microscopical work, contributing a large array of evidence.

We have not been able until now to present our own views in full because many of our experiments required a long time to verify and confirm; some afforded perplexing and almost contradictory results, requiring a long time to clear up, and involving much repetition; and we may add, in explanation of the apparent delay, that what takes but little time to write or say often requires months, and even years, of disappointment and practice to work out.

In the autumn of 1881 we were only justified in speaking with any amount of positiveness upon one point, namely, the actual presence of micro-organisms in carious dentine. This one fact, and the evidence in support of it, formed the body of the paper we ventured to present to the International Congress. Micro-organisms were found in every fragment of carious dentine of which we cut sections, and we had cut immense numbers; the leptothrix of M. M. Leber and Rottenstein was, we found, a superficial growth.

Another fact of scarcely less importance, but one supported by far less evidence, was that the agencies to whose action caries had up till then been attributed by a large majority of scientific opinions, namely, certain acids, were unable to produce any such changes upon teeth exposed to their action alone, although the enamel protection was removed, and the acids employed were those present in the mouth. We had read many allusions to caries produced in teeth out of the mouth by artificial means; we employed the means indicated (whenever they were indicated, which was rarely), with the addition that we did so under absolutely aseptic conditions, we repeated the experiments, and the result of (in some cases) years of exposure was that no change that we could detect took place. Here was a second, but a negative fact.

The third fact obviously required was a positive one: it remained to inoculate dental micro-organisms into the flasks and observe the result. We did so, and the result was change in the exposed dentine, but so slight that we could not succeed in cutting a section; still, at the time of our paper of 1881, we firmly believed that this change, when allowed to become more intense, would prove to be caries. Of this fact we felt bound, however, to speak very cautiously and for the last two-and-a-half years we have employed every means in our power to clear it up—with what result we shall endeavor to make plain to you to-night.

We are anxious that you should keep clearly before you four main issues, upon which all the theory which we suggested to you in 1881 depends.

1. That certain forms of micro-organisms, namely, micrococci, rod-shaped and oval bacteria, and short bacilli are invariably present in carious dentine.

2. That these micro-organisms extend into the tissue as far as does the caries.

3. That no agents can be made to produce a change resembling caries in the absence of such micro-organisms, *i. e.*, under aseptic conditions.

4. That under septic conditions a change can be induced which, although we are prepared to call caries, does in some particulars resemble it; teeth in which this change has been produced we shall submit to you to-night, and also suggest to you why we hesitate to call it caries.

These four points once established upon reasonable evidence, we shall ask you to consider whether we are not justified in deducing from them the conclusion that micro-organisms play an important part in the production of the disease as we see it and are called upon to treat it, and that their active presence is an absolute essential to its production.

We may add incidentally that we never suggested that no other agency assisted in the process, although a recent writer attributes some such absurdity to the advocates of the germ theory. We do not consider ourselves justified in wasting your time over such a digression. The first point to discuss, then, is the constant presence of micro-organisms in carious dentine. Upon this point the evidence submitted to the profession by us in 1881 was very strong, We were then able to state that, since we have succeeded in properly cutting and staining sections, we had always discovered micro-organisms. The appearance was not caused by softening agents, because the teeth were cut fresh and immediately after extraction. The number of sections cut by us between 1879 and 1881 was so great that we were convinced that the phenomenon was constant.

Since then Mr. Charles Tomes has, we believe, made some investigations which have led him to concur in this constant presence.

Dr. Miller, of Berlin, has cut a very large number of sections of carious dentine, with a result which is completely confirmatory of our assertion that micro-organisms are invariably present. In fact, this point has been confirmed by every careful observer, and may be considered to be completely established.

The second point is one very much more difficult to decide—the more so because statements have been made upon this point which tend very much to confuse the mind of the reader. It has been stated by Dr. Miller, who has written a very large number of papers upon this and kindred subjects during the last two years, that there is a zone of softened dentine of considerable width, not infected with micro-organisms, separating the normal dentine from that which is so infected: and, further, that the outline of this area of softened dentine does not correspond with the outline of the area affected with organisms. We have attempted to verify this observation, but we have arrived at the conclusion that if there be any such zone at all we cannot believe it to be of any considerable depth, as we have not succeeded in finding any softened tissue that did not contain micro-organisms. Having regard, however, to Dr. Miller's reputation as a careful and conscientious explorer, we do not desire to attach too much weight to negative evidence; later on we shall suggest some weighty positive evidence on this point. With regard to the outline, we have invariably found the outline of the changed tissue to correspond with that occupied by micro-organisms, and we feel less hesitation in doubting this latter statement of Dr. Miller because he claims to be able to compare these outlines with the naked eye, unaided by any instrument; we think that this is too rough a test for objects whose greatest measurement does not exceed the 1–1000 of an inch.

There is no doubt that it is easy to establish a line of demarcation with the aid of a sharp instrument between tissue that you can easily prick and that which is quite hard: this line no doubt corresponds very nearly to the edge of the disease; we have also come to the conclusion that in corresponds very nearly to the edge of the micro-organic invasion, that is, we have cut sections as near as we could to the healthy tissue, and have found them infected. We do not, however, attach so much weight to this fact as to the following experiment, which we think must be allowed to be absolutely conclusive.

Before we can explain its full weight we must enter into a few details of the method we employ to grow and cultivate special germs. We used to make a meat infusion, boil it, introduce it with antiseptic precautions into aseptic test tubes, and seal the tube with wool. If the fluid remained clear we knew it was pure ; if we became turbid within a day or two we knew our precautions had not been complete, and some germs had been introduced accidently, and the tube was of course useless. If we wished to grow a special germ we rubbed a purified probe against the infected spot, and introduced it into the fluid, replaced the wool cap, and the ensuing turbidity denoted the growth of the germ. The objection to this plan was that the turbidity spread through the entire fluid, and if we had, despite our precautions, introduced any other organisms besides those we specially intended to introduce, they all became inextricably mixed in the ensuing putrefaction. To obviate this we adopted Koch's plan of adding gelatine, and instead of a pure fluid, making a pure jelly; when this was inoculated in a particular spot the growth was confined to that spot, and if anything else dropped on the surface of the jelly it grew there quite separate. Under these circumstances we noticed that different forms of germ grew in quite different ways, some, for instance, forming a white ball, others a mass of spiculæ others wavy lines; these peculiarities of growth could be easily reproduced in other flasks by a second inoculation, until we found it quite easy to separate each variety and grow it by itself without any extraneons growth to confuse the result. We have brought down some flasks with growth going on to show you to-night. Well, we proceeded to inoculate flasks with those deepest portions of softened tissue which formed the most out-lying layer of changed dentiue, and we found that from these portions a growth of organisms proceeded, proving beyond doubt that organisms were contained in the pieces inoculated. This is not a doubtful experiment; it absolutely demonstrates that the deepest portions of the softened tissue contained organisms, and that if there exist any zone of alteration beyond them it is so microscopically narrow that we have not been able to detatch a fragment of it.

We do not, however, deny that there is a great probability that the advance guard of micro-organisms may be surrounded, and, *to a microscopical extent only*, preceded by a softening, the result of the action of those acids which they themselves produce,—we shall be able to show that they do generate acids capable of softening dentine, and therefore we should expect to find this effect slightly in advance of their presence,—but this is hypothesis merely. We would further add that the transition from very carious tissue to that which seems quite healthy to the eye and the touch is, in the greater number of cases, more sudden than this is generally supposed, and allows but little space for this non-infected zone; to convince one-self of this is only necessary to split a number of carious teeth and prick the surfaces. One more fact should be borne in mind in this connection, namely, that healthy dentine softened by a weak acid does not look different under the microscope from healthy dentine cut fresh, and it is therefore impossible to detect the softening microscopically; the tubes are not larger, nor are they irregular, as is the case in carious dentine—in fact, the existence of such a softened and uninfected zone separating the infected from the non-infected dentine is a matter so difficult to demonstrate that we do not think much value is to be attached to it.

We now come to the third point, viz., that it is not possible to produce caries or anything resembling it, by subjecting teeth to the action of acid fluids in flasks out of the month, provided the flasks be kept in a strictly aseptic condition. We do not think this point has ever been disputed, and we feel in a position to state that the evidence upon which it rests is incontrovertible; but before discussing it, and the point that follows it, we think it will not be a waste of time to explain what we mean by a change resembling caries. We mean a change by which the tissue affected is made distinguishable from that which is normal to the naked eye and touch or under the microscope. To the naked eye it must become discolored,—we only mean changed in color, and not necessarily brown; the surface loses its polish, or, if moist, the affected part must be separable from the healthy with an instrument; to the touch it must become softer; under the microscope the channels must become dilated at the expense of the matrix. In 1881 we exhibited several flasks in which infusions of meat and saliva containing malic, butyric, and other acids had been allowed to act upon exposed dentine for periods varying from one to three years; the teeth were liable to caries because they had suffered already from it; healthy portions were denuded of enamel and partially protected by wax, a certain part being left exposed, with no perceptible result whatever. Of course a strong acid, or a large amount of acid, would decalcify the tooth, but this does not resemble carious change.

These experiments were sufficiently numerous and conclusive to warrant us in passing on to the fourth point of this investigation, and this will detain us longer than any of the others, as it is in this direction that we have experienced the greatest difficulty and the most perplexing results.

We were so fully alive to the overwhelming difficulties attending any attempt to reproduce out of the mouth the complicated conditions existing therein, that we should have felt anything but sanguine but for a curious accident that encouraged us to proceed in this direction. We will therefore commence by telling you the particulars of this accident.

At the Congress in August, 1881, we exhibited, among other flasks, a series intended to illustrate the fact that no change resembling caries could be induced upon the surfaces of teeth under aseptic conditions. These flasks all contained an infusion of meat and saliva with malic and butyric acid and teeth susceptible of caries, the surfaces ground down to expose the dentine, part of the exposed surface being protected with wax, so that any loss of substance could be at once be detected in the exposed part. Now these flasks, which were labelled i, iii, iv, v, vi, had remained perfectly pure from the time they were put up, June 1880, till the Congress, August, 1881, that is, fourteen months, and no visible change had taken place in the exposed surfaces. In taking them home in a bag, flasks i, iv, and v fell down, allowing the fluid to come in contact with the cap covering the flasks; iii and vi remained upright.

In the course of a few days, flasks i, iv, and v, which had tumbled down, became turbid; iii and vi remained, of course, pure. By the 5th of December, 1881, iii and vi were to all appearances, as before, unaltered; but the teeth in i, and iv, and v were already discolored brown; moreover the discolored parts were on the surfaces slightly softened, and although the change was so shallow that we could not obtain a good thin section of it, we could see that the tubes were enlarged and contained a material that stained readily, which, owing to the thickness of the section, we could not, unfortunately, identify. Now, whatever this change was, it was manifestly dependent upon the introduction of organisms; nothing else was introduced. Fourteen months' immersion in the fluid when aseptic failed to change the teeth at all; four months in the same fluid plus germs produce a change; the same additional four months in the sister flanks produced no change at all;—this seemed an important addition to the facts in our possession at the Congress. The next stage was less satisfactory: the change did not seem to progress; do what we would, we could not produce a considerable change. We conceived that this might arise from the fact that several important conditions favorable to the activity of the germs in the mouth were absent in the flask. First, the temperature of the body; second, opportunities for lodgment; third, constant renewal; fourth, unlimited and varied pabulum; we therefore contrived a very elaborate experiment in which we proposed to assemble all these conditions, and as many more as we could think of. We erected a large incubator, which we kept continually at the temperature of the human mouth; it was divided into an upper and a lower story, which communicated by an aperature. In the upper story was a small bath with a tiny tap contrived to drip drop by drop through the aperature into a second bath in the chamber below; this again dripped into a receiver, the fluid being thus kept in a constant circulation through the middle bath. In this middle bath were placed some teeth set side by side as in nature, the roots being implanted in a block of hippopotamus ivory, and weak points created in the interstitial parts with the burring engine, the size of the bur being kept to test any enlargement of the holes, and some others implanted in wax. The upper bath was then filled with saliva, milk, bread decaying teeth, meat, etc.; while some fragments of the latter were inserted about the teeth in the middle bath. The lowest receptable was periodically emptied, while the top one was periodically fed. Without troubling you with more details, we thus contrived to assemble the proper temperature, the pabulum movement, and the normal disposition of the teeth. Now six months of this highly unsavory experiment produced scarcely any perceptible change except that all the tissues became black, the holes drilled in the blocks and in the teeth were the same size, and their edges were not a bit softened. The putridity of the baths was, however, so offensive, that it was with some relief that we decided to abandon this particular experiment. We saw that some great essential condition was absent, and though a longer period might doubtless have produced slight changes, my health and appetite suffered from the constant exposure to all these putrid smells, and we agreed to stop the incubator; but this experiment, though apparently a failure, led us to what we conceive to be the true solution of the difficulty. So far we have decided only that some essential factor has been omitted.

[TO BE CONTINUED.]

ARTICLE V.

SALIVARY CALCULUS AND ITS REMOVAL.

BY J. FRANK MARRINER, OTTAWA, ILL.

Read before the Illinois State Dental Society, May, 1883.

The quantity and color of salivary calculus, or tartar, as it is generally called, varies in different temperaments, and the general state of the health exercises a great influence in each case. Phosphate and carbonate of lime are its principal ingredients. A small quantity of animal fat also enters into its composition, and the relative proportions of its constituents vary according as it is hard or soft, or as the temperament of the individual from whose mouth it is taken, is favorable to health or otherwise; hence it is that the analysis that have been made by different chemists differ. Nearly all persons are subject to deposits of salivary calculus, though not all alike. In some cases it collects in large quantities, and less so in others; its characteristics, both chemical and physical, are exceedingly variable. At times it is composed almost wholly of one ingredient, at other times of two or three. Neither is it always of the same color. In one case it is black, at other times dark brown, and again nearly white. It differs greatly in density. The black is hardest, the white softest. There are two kinds of tartar, both called black, but differing in many particulars. One is most generally found in the mouths of persons whose physical powers have been reduced by disease, intemperance, etc. It is found in quant ties near the salivary ducts, firmly adhering to the teeth, and its removal is accomplished with considerable difficulty. It is very black, and is covered with a very offensive mucus.

This form of salivary calculus is attended with villainous consequences, not only to the gums, alveolar processes, and teeth, but to the general health. It causes the gums to inflame, suppurate and recede to the necks of the teeth, in some cases uncovering the root on one side its entire length. It grows constantly, it creeps, insinuates, causing death and destruction until the support is entirely destroyed, causing the tooth or teeth to fall out.

The secretions of the mouth are bad and rendered unfit to be taken into the stomach.

The brown tartar is less hard, and is found in large quantities on the lower front teeth, and also on all teeth, but in less abundance.

Its removal is accomplished more easily than either of the other varieties. The effects of this are less injurious than that of the last noticed, yet in many respects like it. It also causes the gums to inflame, swell, suppurate and recede from the teeth, destroying their support until they loosen and drop out.

Salivary calculus of a pale brown color is of a consistency much softer than either of the dark varieties, and is removed easily, but its effects are quite as disastrous as any other.

White tartar seldom accumulates in large quantities; it is very soft, causes but little irritation, but is by no means harmless, as it corrodes and causes rapid decay of the teeth.

There is a sort of parallel between salivary and urinary deposits. We may have a deposit of lime salts whenever these salts exist in a fluid under certain conditions A familiar example is the coating in the tea kettle where hard water is used, an illustration that may be very properly employed for the instruction of our patients. These salts exist in saliva, and are either deposited or remain in solution. There is a variance as to quantity present in different individuals, and at different times and circumstances in the same individuals. These differences are modified by constitutions, habits, modes of life and exercise. They are increased in quantity by hard labor, and are kept in solution partly by motion.

Deposits are favored in various ways: first, as the point of saturation is neared; second, as fluid loses motion; (the stillest place in the mouth is under the tongue in front, adjoining the lower incisors ; there is a constant flow between the cheek and posterior molar above); third, by rough surfaces, such as half-cleaned enamel, fourth, foreign substances; salivary calculus forms readily wherever any body exists for a nucleous ; and last, mouths that are allowed to remain in a dirty condition, with particles liable to lodge next the gums or between the incisors below, are in every extremely favorable to deposits.

And now as to remedies. As I understand it, they can nearly all be summed up in one word, viz., *cleanliness*.

I have little faith in any so-called constitutional treatment. In ninety cases out of a hundred the teeth must be cleaned and kept as nearly so as possible by the combined effort of dentist and patient. Cleaning and polishing the teeth is an operation that cannot be performed at one sittting. It ordinarily takes two, and in some cases will require three or four. Nor is one operation of this kind, be it ever so thorough, going to answer for all time, or during the natural life. It must be done again and again, yearly, semi-yearly and oftener if necessary. The idea is, keep them clean. If once a year will accomplish the work, all right, but keep them clean, if it has to be done every month in the year.

It is a notorious fact that the operation of removing salivary calculus and other deposits from the teeth, thoroughly cleaning and polishing them, is neglected oftener than any other in the line of our duty as dentists. And there are several reasons why this is so. Among them are ignorance, laziness, want of proper instruments with which to do this work, and the small amount paid us for such operations. Ignorance and laziness may sound harsh in this connection, but however much we may dislike the sound of it, it is nevertheless true. And as to instruments, I think I am correct in saying that there exists a great deficiency in this line. You would be surprised to see and know what kind of instruments many of us are using for this important work. Why, some of them look very much like clam diggers, and are quite as well adapted for that work. And then we are poorly paid for this work, and there are several reasons also for this, one of which is that we, as dental advisers and teachers, have as yet failed to impress its importance upon our patients. Teach them its value, show them that upon *this* rests the success of every other operation performed in the mouth. Teach them this at the outset, the first sitting, which can be easily accomplished if we will but take the trouble. Intelligent patients take our advice and explanations kindly, and, when understood, really submit to and acquise in our judgment. A proof of this is their readiness to endure both pain and inconvenience and willingness to pay for the work.

I say we are poorly paid, another reason for this is, our patients do not, as a rule, understand its importance. They think it is but a few minutes work that the dentist should always *throw in*. And the reason for this opinion is that dentists are in a large majority of cases in the habit of giving but a few minutes to this kind of work, and consequently the operation is not half formed, simply torn in pieces and left in a ragged condition, a disgrace to the operator, and instead of benefiting only aggravating the case.

We know that a set of teeth so poorly cared for that the mouth has become filthy, is unsightly, uncleanly, and offensive, in fact, an abomination to one laying any claim to cleanliness, yet we, as dentists, are asked expected to look for an hour or two into this cess-hole of filth and to keep our eyes open and our stomachs right side up, while we are performing this unpleasant and sometimes disgusting operation for little or next to nothing.

Who wonders that it is neglected, and yet when we see the benefits derived from it by our patients, we are led to ask, why it is ever neglected ?

Simply because we have not done our whole duty in this matter. We have not only failed to teach those coming into our hands the importance of it, but also have again and again failed to perform the operation in a thorough and faithful manner.

It appears to me to be a piece of sheer stupidity to put fillings into a dirty and diseased mouth, without a preparation looking to a better state of things.

A lady came to me not long ago to see what could be done for an abscessed central incisor, said it had been under treatment for eight months, but without success. An examination showed her mouth to be in about the following condition: the incisors, cuspids and first bicuspids below were covered with salivary calculus, nothing to be seen but their cutting edges; both sides of the second bicuspids and molars above were in about the same condition; rings of salivary calculus around the necks of all the other teeth, with pus flowing out from the gums and around each tooth, and pressure upon the soft parts caused pus to ooze from every pore. And that tooth was under treatment eight months by a man calling himself a dentist, without a suggestion to the patient as to the true condition of her mouth. There is nothing a dentist can do that will rebound more to his credit, or the pleasure and profit of his patient, than to remove salivary calculus and all deposits from the teeth. Thoroughness is all important in this, because particles wherever left are so many nuclei for new deposits.

There is another matter in which many of us are to some extent at fault. It is in not laying more stress upon the necessity for the early training of children in this matter of cleanliness and care of the teeth. For instance, take each man's practice (the adult portion), and I venture to say not one patient in fifty knows how to brush his teeth properly, nor one in a hundred that the six year molars are not members of the deciduous set, or if they be cleanly or otherwise. If this be true, to whom are we to look for early training? Evidently not to them.

Then let us look this matter squarely in the face. It must be met; it can neither be set aside, assigned, nor distributed. The responsibility rests upon us as a profession Then let us see that we so teach our patients that may become competent to train the young, and by so doing couse them to assume the responsibility, or at least share it with us. The greater part of this teaching must of necessity come from us.

And still another thing, though perhaps not properly belonging to this paper, I wish to speak of. I have had patients referred to me by physicians, and quite often of late, as suffering from scurvy, and have heard dentists talk of their patients having scurvy. In a practice of twenty-five years I have never seen a single case. Scurvy is a disease which is characterized by a depraved condition of the blood. In consequence of this morbid state of the blood. there is a great debility of the system at large, with a tendency to congestion, hemorrhage, etc., in various parts of the body, and especially in the gums. It is said to have prevailed in badly-fed armies and in besieged cities, which I do not believe.

Its ravages among seamen, however, have been most appalling. There are instances where whole crews have been prostrated by this scourge, as in the case of Lord Anson's memorable voyage. Scurvy is a systemic disease, as much so as typhus or typhoid fever. Scurvy resembles purpura very closely in its general symptoms, and yet, notwithstanding their similarity, they are essentially different. Scurvy is caused by privation for a long time from fresh, succulent vegetables. In this disease there is extreme debility and depression of spirits, and mercury does positive harm, while a cure is rapidly effected by the use of fresh fruits and vegetables.

On the other hand, in pupura, mental and bodily depression are always absent, and mercury in most cases affords relief, while not a sign of relief follows the use of fruits and vegetables that are all powerful in scurvy. And here, in my judgment, is where confusion began, by calling purpura, scurvy (land scurvy), a term entirely out of place, I think. I do not believe such a disease as land scurvy ever did or ever will exist.

But why salivary calculus should ever, under any circumstances, be taken for scurvy is a mystery to me, at least.

There are perhaps two symptoms—congestion and hemorrhage of the gums—which are as much symptoms of typhoid fever as of scurvy, for they are symptoms of typhoid fever,and they are to be relied upon in both mild and severe cases. How can scurvy exist in a land like ours, with a soil from ten to thirty inches deep, growing all kinds of vegetables, especially potatoes, and a thousand miles from God's salt ocean ? I would not advise a dentist practicing in this State, at least, to ever tell his patients that they have scurvy, but instead, tell them the truth, that their mouths are diseased and filthy, caused by salvary calculus, which in ninety-nine cases in a hundred, is the parent of Riggs' disease, or so-called pyorrhœa alveolaris.—*Archives of Dentistry.*

CORRESPONDENCE.

TO THE EDITOR OF THE AMERICAN JOURNAL OF DENTAL SCIENCE.

Dear Sir :—In an examination made yesterday in company with Dr. Robinson of the dental institution at the Patent Office in Washington. We found one patented by Mr. Wyatt of Norwalk, Connecticut, for "relining rubber plates," dated February 19th, 1884.

May I ask through the dental journals on what ground Mr. Wyatt claims the invention, as the process of lining and adding to rubber, by means of dovetails and undercuts has been explained in all good works on Mechanical Dentistry for the past twenty years, and has been worked by myself and others in thousands of cases.

Any invention for the benefit of the profession deserves good support from us all, but patenting any process, under a false declaration, what it is new, simply because a patent has not been applied for before and where the supposed inventor has only taken out papers for notoriety amongst patients should be vigorously put down.

By Mr. Wyatt's claims we should all be prevented repairing rubber plates, or adding new teeth to old ones, or dovetailing a rubber base to hold a celluloid mounting. Did it stand good? But fortunately for the profession I am in possession of work made many years ago which fully illustrates his claim and therefore the profession *is at liberty* to reline, repair, or add to rubber dental plates without paying Mr. Wyatt a royalty.

D. GENESE.

CHANGE OF DATE.

As the dedication of the Buckingham Monument takes place at Hartford, June 18th, the meeting of the Connecticut Valley Dental Society has been changed from June 18th and 19th, to June 19th and 20th, at Savin Rock, New Haven, Connecticut.

W. F. ANDREWS, *Sec'y.*

HARVARD UNIVERSITY
DENTAL SCHOOL

EDITORIAL, ETC.

THE NEW BUILDING OF THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MARYLAND.—Owing to the large classes, it has been found necessary to increase the size of the Dental Infirmary and Laboratory Building, by the erection of two extensive wings, which afford so much additional space to the large Infirmary Hall, as to give some *two hundred* running feet of continuous window fronts on the second story, and additional Museum, Reception, Impression and Extracting Rooms on the first story.

The Dental Laboratory now presents *one hundred and eighty* running feet of students' work tables. For eligibility of site and arrangement—having been erected especially for instruction in practical dentistry—this Dental Infirmary and Laboratory Building is not equalled by any other similar structure in this country. It commands unobstructed light from every side by means of *sixty-five* windows. The practice is very large, as frequently over twenty patients are in waiting in addition to those undergoing operations. The number of patients for the extraction of teeth is simply immense, the average number per day for each student reaching as high as *twenty*. The Infirmary practice is increasing to such a degree that all of the students now in attendance upon the Summer Practical Course have more than they can possibly attend to. No other dental school has superior facilities for obtaining patients, upon which students gain that practical experience so necessary in the practice of dentistry.

THE BOARD OF DENTAL EXAMINERS.—Drs. E. P. Keech, Chas. E. Duck, Richard Grady and T. S. Waters, of Baltimore, and Edward Nelson, of Frederick, recently appointed by Governor McLane, met for organization Saturday. Dr. Keech was elected President and Dr. Grady Secretary. It is now the duty of all dentists to cause their names and residence or place of business to be registered with the board, and those who were engaged in the practice of dentistry when the bill was passed must verify the statement under oath before a Notary Public or Justice of the Peace. Regular meetings of the board will be held the third Saturdays in June and December, when those who desire to practice dentistry may appear for examination. Any person who wilfully violates the law is subject to fine and imprisonment. The general experience of the workings of laws regulating the practice in various States is that only about one-third of the candidates for examination are granted certificates.

OBITUARY.

DR. SAMUEL W. NEALL.

Died at Camden, N. J., on March the 29th, 1884. DR. SAMUEL W. NEAL, aged 76 years.

Dr. Neall belonged to that class of old-time dentists that is rapidly passing away, and he deserves more than ordinary notice. He was born at Milford, Delaware, February 10th, 1808, and came to Philadelphia at the age of sixteen. In his early life he followed the occupation of a printer until thirty years of age, when he studied dentistry with the firm of Harbert & Neal in this city. He graduated under them, and, according to the custom in vogue in ante-dental college days, received their diploma, which was kindly shown us by his son, a quaint piece of parchment, printed with gold foil, (done by Dr. Neall himself), stating that "he had concluded his studies, &c.. was well prepared in the branches of practical and operative dentistry; the *modus operandi* of setting teeth according to modern style; and the *manufacture of porcelain and mineral teeth.*" This was dated February 18th, 1838, and signed Harbert & Neall, 303 Arch Street. In 1840 he first commenced the manufacture of artificial teeth, and was the second oldest manufacturer for the general market in the country; Samuel W. Stockton being the first. He followed the dual occupation of dentistry and manufacturer in this city until 1862, when he relinquished the former but continued manufacturing—part of the time in conjunction with his son—until March, 1881, when he gave it up entirely, and his son became his successor. He enjoyed his retirement but a little over two years, when he was taken with the sickness—heart disease and dropsy. That terminated in his death.

Dr. Neall was the first manufacturer of teeth that "put the gum enamel in the mould," the others adhering to the old practice of using a brush for some years. But one by one they gradually adopted his system, which is now universally used. Dr. Neall was a most excellent operator, a fine mechanic, and a careful, quiet laborious man. By a blameless, industrious life he acquired a competency, made many friends, and the science of dentistry is none the worse that he has left upon her the impressions of his handiwork.—*Dental Office and Laboratory.*

BIBLIOGRAPHICAL.

The following notices were prepared for the April number of JOURNAL but were inadvertently omitted by the printer.

A SYSTEM OF ORAL SURGERY.—Being a Treatise on the Diseases and Surgery of the Mouth, Jaws, Face, Teeth and Associate Parts. By James E. Garretson, M D., D. D. S., Illustrated with numerous illustrations. Fourth edition thoroughly revised with additions. Publishers: J. B. Lippincott & Co., Philadelphia, 1884, Price, cloth, $8.00; sheep $9.00.

The value of this noted work is increased by the addition of a considerable amount of interesting matter on subjects not heretofore alluded to, and much has been added to many of the former chapters. Seventy-five new illustrations appear to increase the value of the present edition, the first four hundred and seventy pages of which embrace the anatomy of the head and face, dental pathology and dental surgery, while the remaining portion treats of such parts of oral surgery as defects of the palate, diseases of the antrum and jaws, neuralgia, tumors of the jaws, inflammation, salivary fistulæ, dislocations and fractures of the maxillæ, anæsthesia, etc., etc.

Although some of the views expressed in this work concerning the development of the teeth, dental caries, etc., may be at variance with the opinions of other writers, yet there are many who will uphold those of the author of this treatise. Dr. Garretson has added so much to the present edition that the work has assumed quite large dimensions and necessitated the use of smaller type, in order to accommodate the 1037 pages in one volume, which is a useful and interesting contribution to the text books of the dental profession.

GORGAS' DENTAL MEDICINE.—From *The Dental Cosmos*, Philadelphia, March, 1884:—

"The author of the volume before us, a distinguished teacher and writer, is well and favorably known to his profession. * * * The work may be said to be the first elaborate attempt to supply a want which every practitioner of Dentistry has experienced. It contains a large amount of useful information which is not to be found in any other volume.

From Prof. Frank Abbott, M. D., D. D. S., New York College of Dentistry:—

"I am so pleased with the work that I shall, with pleasure, recommend it to the students of our College (as well as to the profession generally), and will add it to the list of text-books."

From Prof. J. S. B. Alleyne, Missouri Dental College, St. Louis:—

"Thoroughly correct, and admirably adapted to the wants of the dental student."

From *The Independent Practitioner*, Buffalo, New York, March 1884:—

"We most heartily recommend it to every one who is desirous of a complete text-book upon dental therapeutics."

Prof. Jonathan Taft, in the *Dental Register*, February, 1884.

"Perhaps no one in this country is better able to prepare such a manual than Prof. Gorgas. He has large experience in various directions, that has, in an eminent degree, qualified him for such a task."

C. T. Stockwell, D. D. S., Editor of the *New England Journal of Dentistry*:—

" I have no criticisms to make of the work. It appears to me to be most admirable for the purpose for which it is evidently intended."

From the *Dental Jairus*, San Francisco, February, 1884.

" No man in the dental profession is better qualified to prepare such a book. * * * The great number of Tables and Dental Formulæ which it contains makes it truly valuable.

From the *Dental Practitioner*, Philadelphia, March, 1884.

" The best book of the kind with which the dental profession has been favored. * * * We have not attempted to enumerate *all* the good things in this book, but sufficient to indicate its general character. The need of such a work has long been felt by the profession, and we make no doubt its rapid sale will express their approval of it."

From the *Dental News*, Indiana, February, 1884.

" We have never examined a work, pertaining to dental science that we can more heartily endorse for real practical merit than this.

NOTES ON DENTAL PRACTICE.—By Henry C. Qinby, Licentiate in Dental Surgery of the Royal College of Surgeons in Ireland, etc., etc. With illustrations, Publishers: The S. S. White Dental Manufacturing Co., Philadelphia, 1884, Price, $2.25.

The author, as he states in his preface, has attempted to present in a series of notes his methods as pursued by him in his office practice, leaving the elaboration of theories and the search after causes in the able hands that are now on both sides of the Atlantic pursuing these investigations. He refers to the treatment of the temporary and permanent teeth; extraction as a means of preventing decay; irregularities; amalgam; pivoting; and gutta percha for impressions in eight chapters containing nearly two hundred pages which are lucid and instructive. Dr. Quinby is an advocate for the use of chloroform in dental operations, to the exclusion of what are generally considered in America to be less dangerous anæsthetic agents, although he advises the dentist to avoid such a responsibility as the employment of these agents entail. A great amount of valuable information can be derived from a perusal of this work.

VULCANITE AND CELLULOID.—Instructions in their Practical Working for Dental Purposes. By L. Eldred Gilbert, D. D. S., Instructor of Clinical Dentistry in the Philadelphia Dental College. With illustrations. Publishers: The S. S. White Dental Manufacturing Co. Price, cloth, 75 cents.

This is a concise monograph which will prove of great service to the dental student inasmuch as its author confines his descriptions of the methods of manipulating vulcanite and celluloid to a few reliable processes. Easily comprehended directions are given for each step of the process, from the taking of the impression to the completion of the denture; and the very moderate price of this useful little work, will enable every dental student to add it to the number of his text books. It will certainly be appreciated by every practitioner of dentistry who may peruse it, as it contains a great amount of useful information.

Transactions of the Ohio State Dental Society, Eighteenth Annual Meeting, held at Columbus, October 31st, and November 1st and 2nd, 1883. Published by the Society.

Transactions of the Illinois State Dental Society, Nineteenth Annual Meeting, held at Decatur, May 8th, 1883. Published by the "Ohio State Journal of Dental Science." Press. Teledo, Ohio.

MONTHLY SUMMARY.

THE THERAPEUTIC APPLICATION OF NITROUS OXIDE GAS. —From a series of experiments made in Prof. Botkin's laboratory in St. Petersburg, Dr. S. Klikowitsch (*Virchow's Archiv.* xliv., 2) draws the following conclusions:

1. Nitrous oxide gas is incapable of supporting respiration in animals and plants, and, like other indifferent gases, leads to death from asphyxia. The asphyxia produced by this gas, however, presents points of contrast to the asphyxia produced by other means.

2. Nitrous oxide gas produces no chemical or morphological changes in the blood of animals, but is dissolved in it and again eliminated, according to physical laws, without apparently being broken up into nitrogen and oxygen.

3. Anæsthesia with laughing gas is closely associated with insufficient oxidation of the blood that it cannot be regarded as absolutely without danger, especially in diseases of the heart, lungs or blood vessels.

4. The association of laughing gas with twenty per cent. of oxygen completely removes the possibility of asphyxia, and produces a number of results capable of therapeutic application.

5. Under the influence of the mixture of laughing gas and twenty per cent. oxygen, in the majority of healthy subjects, the heart's pulsations are increased, the pulse-wave diminished, and the respiratory movements decreased in number and increased in depth; these effects pass off in from three to five minutes.

6. In six weeks of weak heart-action, the above gaseous mixture produced no unfavorable results; on the other hand, the pulse was decreased in frequency and increased in strength. These effects lasted from one to two hours.

7. In cases of disturbed respiratory innervation the mixture of laughing gas and oxygen regulated the respiratory rhythm and rapidly removed the subjective and objective signs of deficient oxidation of the blood.

8. This gaseous mixture acts as a transient anæsthetic, and in angina pectoris causes a rapid removal of suffering.

9. It is to be preferred to chloroform as an anæsthetic in labor.

10. Vomiting and cough of reflex origin are arrested by a few inhalations of this mixture of gases.—*Philadelphia Medical Times.*

ARTIFICIAL CROWNS.—We have made some very serviceable artificial crowns on bicuspid roots in the following manner: Trim up the end of the root neatly, and drill a tolerably good sized hole into it in a direct line. Into this, carefully but firmly, introduce an ordinary steel screw, such as can be procured at the hardware store. Fit around the root a cage or cell of annealed, thin saw blade such as we use for other purposes, and of such a length as to come to a line with the required height of the crown. When adjusted, tie it with fine wire; or, if there is not sufficient space between the teeth, secure with waxed silk floss. Then mix a sufficient quantity of amalgam *very dry* and *mallet* it into the cage and around the screw with tolerably warm instruments. The patient may then be dismissed for two or three or four hours, with the cage *in situ*, keeping a thin disc of cork between some of the teeth to prevent contact for the time being. Upon returning the cage is removed, and a few minutes with the file, corundum stone, and emery cloth make a good finish. The operation is speedily performed, is inexpensive. and makes a good masticator. The *dry* amalgam contains less mercury, and when malleted with warm instruments becomes hard in an hour or two, sometimes a little longer. The rubber dam may be used if there is sufficient projection of the root; but we do not think it necessary, the napkin keeping things dry long enough to pack in the amalgam.—*Dental Register.*

ETHER.—In the *Lancet*, Dr. H. Bendelack Hewetson discusses the relative value of ether when prepared with "rectified" or "methylated" spirits of wine. The author states that there is a great difference between them. That prepared with rectified spirits has been found by those who have used it less safe and less desirable, producing more sickness and laryngeal spasm in certain cases in which there is a tendency to such complications. Of the use and applicability of the methylated ether—as the safest anæsthetic known, when carefully administered by means of Clover's inhaler—he can speak strongly, as the result of daily observation. It is a very ordinary circumstance to occupy eighty seconds in producing complete anæsthesia, without a struggle or a cough, and it is by no means extraordinary for a patient to be "fully under" *within* the minute. In the case of short operations upon the eyes, and the like, it is hardly ever necessary to reapply the inhaler after it has once removed for the operator to commence, the patient remaining sufficiently anæsthetic for an operation such as mentioned to be completed without hurry. Anæsthesia can be prolonged with equal safety even so far as to keep a patient in labor completely under its influence for upwards of *four hours*, the longest time which has happened in my experience. Methylated ether is, I consider, from this point of view, the safest and cheapest anæsthetic at present in use.—*Medical and Surgical Reporter.*

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ARTICLE I.

THE WISCONSION DENTAL COLLEGE.

BY DR. ADOLPH PETERMAN, FRANKFORT–ON–THE–MAIN.

(Translated for the "AMERICAN JOURNAL OF DENTAL SCIENCE" by C E. Hebbell.

A few years have scarcely passed since the trade in Doctor Diplomas has been checked by the conviction of John Buchanan, proprietor of the celebrated Doctor Factory at Philadelphia. This disgraceful business is again stirring itself, and then as well as now these worthless papers are sought to be disposed of mainly to persons residing in Europe. The following lines may be in place to serve as an explanation before this evil assumes too great dimensions.

The New York *Haatszeitung* No. 62, of March, 1881, writes:

"Wisconsin enjoys the possession of a Doctor Diploma Factory, though it be only a Dentist Factory. The Denta College at Delavan, Wisconsion, issues such Diplomas "in absentia" for $12. The entire College consists of a few poorly furnished rooms in the second story and the President of the same, who calls himself Doctor, is Mr. George Morrison, who is at the same time Secretary and Treasurer, and perhaps the entire faculty in person. Besides Morrison are two more 'Professors,' viz: John Morrison (son of the President) as Professor of Dental Surgery, and D. B. Devendorf, M. D., as Professor of Anatomy and Surgery."

Lately an advertisement was to be found in the columns of the "*Kladderadatsch*" and "*Fliegende Blatter*," offering the diploma of Doctor of Dental Surgery of an American College, and upon addressing the agent in England who would give all required information, the following answer was received:

WEST GRINSTEAD, *April 17th.* 1883.

Dear Sir:

In answer to your letter, I would inform you that I can provide you with the Diploma of Doctor of Dental Surgery from a Dental College in the State of Wisconsin (America.) The requirement is that you transmit in writing a work on Dental Science or Dental Mechanism. In America a person is at the same time Doctor of Dental Surgery and Dentist, upon request it may also be added that you have been appointed dentist. The price for this is 500 mark. If you are determined to procure for yourself this title, you will find me prepared to give all information and undertake the management. The Academy is authorized by the State to confer the Degree of Doctor, and the Diplomas are recognized in the United States.

Respectfully,
W. ROTT,
West Grinstead, Trussex, Eng.

In the last year this swindle Association known as the Wisconsin Dental College sent its proposals to all possible addresses in Germany. This *pure* College offers its Diplomas of Doctor of Dental Surgery for twelve dollars each, In order to disguise this gigantic swindle, these purchaseable and worthless diplomas are conferred "honoris causa." Investigations pending at the time between the Chancellor of the German Empire and American Embassy at Berlin, confirm the fact that American Universities and Colleges are not permitted to graduate "in absentia." As we now see this American law is evaded by the addition of "honoris causa."

The following is a copy of one of the said proposals which is generally accompanied by a printed request for an appointment is as follows:

This statement is made to the Faculty of the WISCONSIN DENTAL COLLEGE, located at Delavan, Walworth Co., Wisconsin, for the purpose of procuring an HONORARY Diploma and Degree of D. D. S., (Doctor of Dental Surgery.)

I am a regular Practicing Dentist.

I am a Resident of..... ....age...........
years. Have practiced Dentistry.................years.

Signed.................................

Witness........................... ......

Edward Hanft a manufacturer of artificial teeth was legally sentenced to pay a fine of 60 mark and to be imprisoned for twelve days, was requested to withdraw his sign and his so-called Diploma, suppressed for illegally bearing the title of Doctor with the addition of being a certified American Dentist by the *Schaffengericht* of Bremen, July 2nd, 1882. The said Hanft asserted that he considered himself justly entitled to the aforesaid titles having received a Diploma from the "Wisconsin Dental College." It was proven by the judicial acts that this College was a swindle concern whose only purpose was the sale of Doctor Diplomas. The German Counsel at Chicago judged the Wisconsin Dental College as follows: Unlimited freedom to exercise some trade or profession is in vogue there. Two or three persons can form a corporation and be entitled to all legal rights of the same. The President of the College, (Mr. Morrison), had informed him in reference to the accused Hanft; that the said Hanft had been especially recommended to him and his colleagues. Hanft had informed him (Morrison), that he had been practicing dentistry for five years in Europe upon which the honor of Doctor had been conferred upon him.

The State's Attorney had still further affirmed that Hanft had not employed himself with the treatment of diseased teeth for five years but that he had been engaged in the butter business with a merchant in Hanover, and that he had procured for himself upon the above mentioned plan without special examination upon untruthful assertions and for money a Diploma as Doctor which is without any value.

The Secretary of the Interior, and the Post Master General of the United States of North America have published the following in reference to the bogus transactions of the Wisconsin Dental College.

" Department of the Interior, Bureau of Education.

WASHINGTON, *July 22nd*, 1881.

To the Editor of the *Dental Cosmos:*

Dear Sir:—The attention of this Office having been repeatedly called to the fradulent practices of one Dr. George Morrison of the Dental College at Delavan, Wisconsin, which was noticed also in the *Dental Cosmos* of March, 1881, I took occasion early in July to call the attention of the Postmaster-General to the same, and I herewith inclose his reply which you may like to publish.

Very respectfully yours.

CHAS. WARREN, *Acting Commisssioner.*

Post-Office Department.

WASHINGTON *July 13th*, 1881.

THE HONORABLE THE SECRETARY OF THE INTERIOR.

Sir:—I have the honor to acknowledge the receipt of your communication of the 11th instant referring to this Department a communication from the Commissioner of Education, inclosing letters, etc., showing the fraudulent character of business carried on by Dr. George Morrison, President of Wisconsin Dental College, at Delavan, Wisconsin.

In reply I have to state that I have this day issued an order to the Postmaster at Delavan, Wisconsin, forbidding the payment of money orders or the delivery of registered letters to the said Dr. George Morrison.

Very respectfully,

THOS. L. JAMES, *Postmaster-General.*

In addition to the foregoing communications I can state with assurance that this Wisconsin Dental College has been repeatedly condemned in American Dental Periodicals for its nefarious transactions in Doctor Diplomas, for instance in the *Dental Cosmos* (Philadelphia, Chestnut and Twelfth Streets), 1881, pages 157, 490, 555—1884, pages 28, Johnston's *Dental Miscellaney*, (1260 Broadway, New York. 1881, pages 314, 349), which all published very complete communications about the swindling and shameful actions of Mr. Morrison and his so called Wisconsin Dental College.

ARTICLE II

DISEASES OF THE ANTRUM—TREATMENT OF

BY FRANK ABBOTT, M. D., NEW YORK.

I presume all of you know something, and perhaps many of you much more than I do, about the antrum of Highmore, its diseases, etc. However, I have been requested by the President of this Society to come here and talk to you upon some subject of general interest to us all, and he chose, among several I gave him, " Diseases of the Antrum." You will excuse me if I talk to you as I would to a class of students, giving you the anatomy of the antrum, its functions, its diseases, their treatment, etc., etc. The antrum of Highmore, or maxillary sinus, is a cavity situated on either side of the nose in the body of the superior maxillary bone. It varies in size from that of a small chestnut to a large hickory nut in different persons. It is said by some to be an irregular triangularly-shaped cavity, but I have so far failed to discover one single instance where the shape of an antrum would give me an idea of a triangle. There are some cases where horizontally it will be found to be extremely flat, others very deep, another will be deep from top to bottom, others again very shallow, etc. The floor of the antrum is the alveolar process, which is immediately over the ends of the roots of the second bicuspid, first and second molar teeth. The roof of it is the floor of the orbit. The plate between the orbit and the antrum is perhaps one thirty-second of an inch in thickness in its thinnest place, but growing thicker as we near the border. The wall separating it from the nares is equally thin. Upon the outside, immediately over the second molar, or between the roots of the first and second molars, the wall is found very thin and easily punctured with a trocar. In the roof of the mouth, on either side, about three-fourths of an inch from the median line, is another point where the wall is thin and easily punctured, the bone being about one-sixteenth of an inch in thickness. The antrum has two openings into the middle meatus of the nose. One of the openings is usually closed by the mucous membrane which lines it. The other is small, only sufficiently large to admit the end of an ordinary probe. When, however, from any cause, the mucous membrane becomes removed, the two openings are readly found, as may be seen in this skull. The same mucous membrane which lines the nares passes through these openings into the antrum, which is lined with it. We have made an opening into it in order that its inner portion may be examined, the thickness of the nasal wall ascertained, etc. Passing an instrument into the antrum in front, we find that it is in this instance an inch and a quarter in depth, and from the floor of the orbit to the alveolar process, (the floor of the antrum) we find it about the same distance, viz., one and one-quarter inches. We have here, therefore, an antrum one and one-fourth inches in two directions. If we now pass the instrument in over the molar teeth, we find it coming in contact with the nasal wall at the depth of half an inch. As I said before, it is lined with mucous membrane the same as the nose. Its functions is supposed to be to hold a certain amount of air, the same as the frontal sinuses, which are located in the frontal bone above and a little to the right and left of the nose. In this skull they are opened and are plainly seen. Not until comparatively recently has it been determined what the function of these sinuses really was. It is supposed the air here contained being of the same temperature of the body mixes with the cold air as it is drawn through the nares on its way to the lungs and heats it to a certain extent, so that when it reaches the lungs it is more agreeable to them that it otherwise would be, consequently conductive to health. It to seems to be a rational explanation at least. You will see very readily, gentlemen, that a severe blow upon the cheek might injure the antrum, as the bony covering is very thin. You can see, also, how a dead tooth may produce disturbance from the protruding of its root through the floor of the antrum. The roots of the first and second molars, and often the second bicuspid, yes, the first bicuspid and canine even, are sometimes involved in an abscess of the antrum. Not long since I had a case under treatment where the lateral incisor had produced an abscess which had worked its way into this sinus. Abscess of the antrum is by far the most frequent disease to which it is subject, and in nearly every case a pulpless tooth is the cause. It is true an abscess may be produced, and is sometimes produced, by other causes, such as, for instance, a very severe and long continued coryza, or a severe inflammation of its lining mucous membrane produced by an injury, but such cases are comparatively rare. I presume there is no a person present who has not, during a very severe cold in the head, had a feeling of distention well marked, in the cheeks and forehead. This is caused by inflammation of the mucous membrane lining the maxillary and frontal sinuses. In such conditions it sometimes happens that the openings from the antrum to the nose become closed, and should the catarrh become chronic, perhaps permanently. Then is it that this sinus becomes filled with an exudation from its own mucous membrane, and unless it be evacuated ulceration will follow, and all the distressing features of an abscess will follow. If, however, it is evacuated before ulceration takes place, the case is called dropsy of the antrum. We have cases of this kind where the face swells to an enormous extent, and large lumps in different places are produced upon the face, which eventually discharge. I know a gentleman who has an opening from the antrum through the cheek, discharging all the time, and the surgeon who has charge of the case is in a fearful quandary to know how to get rid of it. I know of another instance where the case has been in the hands of a gentleman in this room, where he finds the opening into the nose has been closed permanently. There has been such a continued inflammation of the mucous membrane in this case that granulation has taken place and closed up the naso-antral opening. Until that opening is re-established he cannot allow the opening which he has through the sacket, where a tooth came out, to close. Should he allow it to close, the autrum would fill, and the patient would have all the trials and tribulations attending an abscess of the antrum. We are told by writers upon this subject that it is usually the palatal roots of the molars which penetrate the floor of the antrum. I have examined many skulls for the study of this cavity, its diseases, etc., and in the great majority of them where any roots of the molar teeth were to be found protruding into it, they were the buccal. It is, however, a very easy matter to find any one, and sometimes even all the roots of a molar piercing the floor of this cavity. The reason for this lies in the fact that no two skulls are to be found where the antrums are just alike. Some are large, some small; some are located high up, while others are down low; some are located forward very prominently, others are to be found very far back. Sometimes in the same skull one antrum is found much higher up than the other, perhaps further back or much larger. So that in the case of an abscess produced by what is called dead tooth, it is almost impossible to determine the particular root that has caused it. The first thing to determine is whether such an abscess exists. This leads us to a study of the symptoms, which are, first, a dull, heavy pain of long duration in the cheek of the affected side; second, tenderness upon pressure over the canine fossa, and in the roof of the mouth upon that side; third, a bulging of the wall into the mouth; fourth, an unusual discharge from the nostril of offensive matter; fifth, a crackling sound caused by the springing of the weakened wall when pressure is produced over the canine fossa. Having determined that an abscess of the antrum exists, we then look for the cause, and, as I have before remarked, we usually find a dead tooth upon that side of the upper jaw, which we at once conclude is the offending organ. This should at once be removed, and an opening into the antrum large enough to admit the point of a syringe, with considerable room to spare, at once effected through the socket nearest the front of the mouth. This is the anterior buccal root socket. I prefer to treat the abscess through this, because it is more convenient to get at. First wash out the antrum thoroughly with warm salt and water, using about a teaspoonful of salt to a glass, or half pint of water. If thrown in with slight force, no irritation is produced mechanically, but instead, this substance has a very soothing effect upon the inflamed mucous membrane. The large size of the opening through which the syringe is passed, admits of the discharge of the excess of material used as a dressing, and it being a depending opening allows the antrum to empty itself, a point always to be observed in the treatment of any disease of the sinus. After using the salt and water, if there is still an offensive odor, syringe with a solution of permanganate of potash and water, two grains to the ounce. This, aside from being the most effective deodorizer we have, is a very good antiseptic. Then syringe with a carbolic solution, one drachm to eight ounces of water, or with listerine. Then make a plug by winding a bit of cotton around a sprig of broom-corn, first notching it a little so that the cotton will not slip off; dip this into carbolized oil—one part of carbolic acid to fifteen of oil of sweet almonds—then push it into the socket so that it enters the antrum, and in order to secure it tie the end of it which projects into the mouth to an adjoining tooth, or if the teeth are all out and a plate is worn, a notch should be cut into the side of the plate so that it may be fastened to that. These precautions are taken to prevent the plug from being forced into the antrum, or its falling out. This dressing repeat once a day, and if an improvement is observed make a plug a little smaller each day, letting the opening heal slowly for about ten days, when it will be nearly closed. Then leave the plug out altogether and let it close up. If no improvement is perceptible after two or three dressings, syringe with a solution of iodine, carbolic acid and water. To the carbolic solution I give you a few minutes since, add an ounce of tincture of iodine; sometimes it may be necessary to use even a more powerful stimulant, such as the following: Zinc chloride, ten grains to an ounce of water. A saturated solution of chlorate of potash in water sometimes proves beneficial. After using the above remedies for several days, if there is still a discharge of pus, give the patient sulphide of calcium, one-tenth of a grain pill three times a day, after meals. Double this dose if necessary. With this treatment I have never failed to get good results.

In case of an abscess, dropsy or any other disease of the antrum, where the teeth are not involved, the best treatment in my judgment, is to make an opening through the mucous membrane and process between the roots of the first and second molars, being careful that the opening extends to the floor of the antrum, so that by inclining the head slightly it will readily empty itself. Then treat as before described.

Another disease, fortunately seldom met with, is that of polypus. I have never yet seen a case, but should one present itself for my treatment, I should, after becoming sure as to diagnosis, proceed to make an opening into the antrum (probably by removing a tooth) large enough to enable me to make a critical examination of its entire wall and when I had ascertained the point to which the tumor was attached, with a sharp instrument, adapted to the case, detach it, cut or tear it in pieces and remove it. With the probability of a return of the tumor, I should take measures to keep the opening into the antrum from closing for some months; then if no new growth was perceptible, allow it to close. —*Southern Dental Journal.*

ARTICLE III.

THE FIRST PERMANENT MOLAR AND ITS EARLY MANAGEMENT.

BY J. HARDEMAN, D. D. S., MUSCATINE, IOWA.

This tooth, attended by so many peculiarities special to itself, when compared with the rest, furnishes cause for special diagnosis, special treatment and special prognosis. It does not differ materially from the rest, histologically or anatomically, nor radically in its functional characteristics. These therefore we pass as not strictly within the compass or importance of the question aimed at, while its more marked traits, in the view of dental practice, will furnish ample material for an earnest consideration.

We say *earnest*, as truly this is one of more than usual importance in the practice of dentistry, and of very grave interests to our patients, and the more so to both, because of the still unsettled theory and practice in regard to it, although it has been the subject of much controversy in dental assemblies and journals, and also among the leaders in the profession almost since the professor's birth.

This tooth is erupted at about the age of six or seven years, and is the first permanent tooth of the entire set as a rule. It is often regarded by the parents, and too often by the family physician, as a temporary tooth, thus leading to fatal results in its management. But we proceed to consider our subject in its more practical phrase ; one that involves the solution of the problem after these minor primary ones have passed. We are then to qualify ourselves to be fully able to bear the responsibility of deciding as experts what science, wisdom and experiences directs us to do, or how to proceed in regard to the successful management of this enigmatical tooth. This tooth comes to fill a blessed mission to the child, and if nature is not ignorantly trifled with, or too imperfectly aided, will certainly fulfil that beneficient purpose.

We will keep in view, that just at this age, when this tooth is emerging, the jaw has more teeth in it than at any other age; and more important still, more teeth in a formative state than at any other time, and too, at a period of life when the demand for element to build osseous structure the very greatest; thus aggregating an inordinate drainage of tooth making pabulum, that probably is not equaled at any other time of life. And may not this fact furnish ample cause for the great tendency of this tooth to caries? And allowing a slight digression, do not these facts admonish that the patient be nourished with food rich in tooth and osseous element? And being supplied with plenty of physical exercise, pure air, regular habits and sufficicient sunlight, etc.?

As we generally find this tooth confronting us in practice already emerged, and more or less diseased, it is more clearly our task to consider how to meet and combat the various abnormabilities threatening, and driving the patient to seek relief at our hands. If, now, we fortunately meet it before the pulp chamber has been laid open, the course of treatment is simple enough, and not likely to divide our views ; but should the devouring caries have already broken this precious precinct of vitality, then the problem presents itself, and the difficulties begin.

One says, cap the nerve and fill; another says, devitalize and fill, while a third says, do these, but if suppurated, extract; a fourth says, whenever the pulp is laid bare, extract; and a fifth says, if one is to be sacrificed, then (sound or not) all four should be extracted. Besides these many very diverse rules, others as by-rules or exceptions to the fundamental ones, are offered. This great diversity of theory must go to prove that the would-be teachers in dentistry are greatly at sea in regard to this matter, and certainly furnishes a perplexing question to the mind of the dental student.

The peculiarities attending this tooth, and giving it its special distinguishing traits, occur before majority or through adult life; and to this period of youth we propose to limit this consideration; or more definitely, we mean the period extending from the eruption of this tooth to the emerging of the dens-sapientæ.

Some very methodical authors would be likely to divide this subject into the following heads: 1. Where caries has not extended to the pulp chamber; 2. Where it has, but the pulp still remaining healthy; 3. Where the pulp is diseased; 4. Where the pulp is dead, and 5. Where the tooth is suppurated. My rule would simplify this, and present but two heads, viz: 1. When the caries has not reached the pulp chamber, and 2d. Where it has. The first may be disposed of as not likely to furnish any controversy or difference in treatment, as we would unanimously pronounce in favor of the efficiency and rectitude of filling the tooth, other things being normal. But in the second division we fully come into the arena by announcing, *we would extract.*

Whenever the pulp is exposed in this tooth at this age, and especially if the second and third molars are not missing, *treat by extraction.* To settle this in our way, we would say extensive anticipated physiological changes in adjoining parts, as well as pathological conditions of the tooth itself. must exert a large influence in treatment. The immature state of the tooth, the absolute need of pulp influence, the changes of position, in consequence of the coming second, and especially the third molars crowding for place. These go far to disqualify this tooth for usefulness and susceptibility of treatment after nerve exposure and nerve death. We think we are safe to say that where in this tooth a nerve is capped, or devitalized, or where the root membranes are suppurating, and this tooth filled at any time prior to the eruption of the dens-sapientæ, the sequel will prove a failure. Not one in fifty will remain in a useful condition at the age of twenty-five; but the rule will be deterioration that amounts to disintegration, passing generally into alveolar abscess, and the finale, quite certainly, will be the removal of the tooth.

It is hardly necessary to say that the loss of nerve influence in cutting off the further supply of mineral and other tooth elements, so much needed in this immature tooth, cannot be expected to be supplied through the peridentium. No such influence from this source can be anticipated. It absolutely requires *nerve* influence to carry onward the deposit of tooth element; and that where it is cut off there is an end to further development of this kind. The tax upon vital energy, while the struggle for position and development of the second and third molars will be too great, and pathological action is established, that generally ends the suffering by the patient's yielding to removing.

Where this tooth is removed at a period sometime before the emerging of the third molar, the second and the third will gracefully and certainly shift forwards and close up the space; securing an excellent tier of grinders, and the concentration and conservation of increased vital energy to the third molar, making that a well matured and permanent organ. While, in contradistinction, an attempt to save a first molar already in this second division, will surely entail unremunerative expense; prolongation of suffering, and approaching despair, though sometimes late, but only too sure, *the tooth is extracted after the emerging of the third molar and a permanent gap as the sure result, with the third* *molar deficiently developed, badly crowded back and out of useful range, of but little service, and of short life.*

The statement that the early extraction of this tooth is followed by a forward dipping position of the second molar, and also of deformity by favoring malformation of the maxillary bones, etc., we can but regard as merely fanciful. The former is much oftener the result of too late or tardy extraction, when it does occur; and the latter is more generally prevented by the loss of this tooth in time, producing improved physiognomic contour, rather than damage; as, indeed, the attempt to save the one is likely to sacrifice the two.

The plan of removing the entire four first molars, where one is past salvation, in order as it is claimed, to secure and maintain perfect articulating antagonism, is, in my view, bad physiology and reprehensible practice. By close observation in hundreds of cases where but one molar of a jaw was removed, we have found nature come to the rescue, and with such complete restitution, that we can but regard the wholesale extraction of sound teeth in this case, and *a lone* for this purpose as erroneous and ill practice. And finally, my observations force me to the conclusion, that capping the nerve by any approved plan, will prove a failure in this tooth any time before the third molar is developed. And if the nerve is devitalized, no mode of root or crown filling, alone with the best therapeutic treatment, will carry the tooth even to adult age, and then worth one-half what it cost in suffering and disappointment. And if enduring perseverance has it in possession at this age. Ninety-nine chances to once, it is more or less a nuisance, and will not be tolerated but a limited period, and then its removal followed by a permanent gap, and very certainly an imperfect third molar.—*Dental Luminary.*

ARTICLE IV.

TREATMENT OF PYORRHEA ALVEOLARIS.

PAPER BY A. W. HARLAN, CHICAGO.

On account of the uncertainty of the mind of the dental specialist with reference to the treatment of that variously named and idly defined disease, known as pyorrhea alveolaris, Riggs' disease, alveolitis, phagedena pericementii, etc., the writer desires to offer a few suggestions relating thereto, which may tend to give more confidence to those who have had but little success in their efforts to restore to health the tissues which are so often ravaged beyond repair. It will not be necessary in this report to say anything of the etiology of the disease under discussion, beyond the expression of the belief that it is infectious, and that micro organisms are at least partially responsible for the disastrous results which are sure to follow if it is not checked before the complete destruction of the alveoli.

It is now nearly two years since I became convinced that the methods of treatment advocated by various writers, including that of Dr. Riggs himself, were not the most beneficial to the majority of cases presenting themselves. At that time I was engaged in making some experiments with the essential oils and eucalyptus globulus, to determine their value as antiseptics. During these investigations it occurred to me that iodide of zinc, which then, as it does now, occupied only a few lines in the "Dispensatory" and works on medical chemistry and therapeutics, might be the remedy which would rob the hydra-headed monster of its terrors for the dental surgeon. I procured a sample and at once made solutions of xii, and xxiv, grs, to the ounce of water, and waited for the first case. It soon came. My first experience with it was in the fall of 1881, and the first case was that of a lower central incisor; the gum was loose two-thirds of the length of the root on the labial surface, pus exuding on pressure, and the alveolar process wasted half the length of the root; there was little, if any, deposit on the lacial surface of the root, and no salivary calculus on any of the teeth, except the buccal surfaces of the superior third molars. I carefully cleansed the root and excised the edge of the bone, then dried the pocket, after washing it out with water, and injected into it three drops of the first-named solution. The patient was directed not to squeeze the gum, but to return in four days, and let me see him. When he returned, I dried the gums and applied pressure, and found scarcely any discharge. I repeated the former treatment, omitting the scraping and probing, and when he returned the second time there was no discharge whatever. The pocket had commenced to fill up, and the gum was beginning to re-attach itself to the tooth. The patient returned again after eight days, and there remained hardly a trace of the disease. To all intents and purposes it was cured. After the lapse of more than twenty months the gum remains firm, and is of normal color, without any external evidence of having been diseased at all. The remarkable manner in which this remedy exerted its beneficial influence in this case caused me to practically discard all other therapeutical agents in the treatment of pyorrhea, except as shall be hereinafter mentioned. I found from a study of cases when a patient was suffering from an acute attack of pyorrhea the pockets should first be packed with iodoform and eucalyptus, iodoform and oil of cinnamon, or be thoroughly syringed with a one to three-grain solution to the ounce of water, of chloride of alumina, which is a good disinfectant and astringent, and also an excellent bleacher for discolored, pulpless teeth; but the method of using it in such cases will be dwelt upon in the discussion on operative dentistry. This method of treating the pockets in acute cases relieves the patient of present suffering, and also reduces the swollen gums to their normal size. In three or four days the sanguinary deposits may be removed and the edges of the alveoli scraped or burred off. The pockets should then be syringed with peroxide of hydrogen, which will cleanse them perfectly, and at the same time bring into direct contact with the diseased pocket a germ-destroyer and antiseptic not less potent than any which can be named. After drying the gums, the pockets should not be injected with the previously named solution of iodide of zinc, one, two, or three drops, or more, in each pocket. When the patient returns on the fourth day the gums must be dried carefully, and a fine cone of cotton or bibulous paper be moistened with peroxide of hydrogen and gently pressed into each pocket. If there should be any effervescence, it demonstrates the presence of pus, and each pocket must be again injected with the iodide of zinc solution. Peroxide of hydrogen, for all clinical purposes, is a perfect detector of pus, even better than the microscope, because those not familiar with it can see with the naked eye the bubbling produced by H_2O_2, when brought into contact with pus.

In chronic cases, after the removal of the diseased bone surgically and the cleansing of the roots are effected, the pockets should be syringed with $H_2 O_2$, to be followed by the injection of the xxiv., gr. solution of iodide of zinc in precisely the same manner as has been heretofore described. In very bad or almost hopeless cases, I use even a stronger solution, grs. xlviii, to the ounce; and when the gingival margins present a ragged border or cone-shaped slit, I apply the pure granular iodide to the edges of the slit once in three days, and soon find a perfect restoration of the normal festooning of the gingeval margin. The injection into the pocket is to be repeated every fourth day. The length of time required for the cure of cases where two to four or five teeth are involved, varies from twelve days to four or five weeks, supposing the patient to be in ordinary good health. In those cases where constitutional treatment is required each must be met according to the indications; and the intelligent practitioner will decide for himself just what is needed during the period of local medication. The worst case that I have had during the past two years was where sixteen teeth were diseased, and it required constant care from March 26th, to June 12th, 1883. It was a case of three years' standing, and had been under the care of two gentlemen before it came to me, and the patient thought her gums were worse after leaving them than before treatment was commenced.

Iodide of zinc has long been used by medical practitioners, in the form of a syrup for internal administration, and as an ointment externally for strumous inflammation and enlargements, chorea, etc. It is made by digesting four parts of iodine with a little more than one part of zinc and twenty parts of water, until the liquid has become colorless. On evaporation it crystalizes and is ready for use. It is freely soluble in water. I present herewith a comparative table of the relative value of antiseptics and germ-destroyers, which as all may see places iodine almost at the head of the list.

This table is the result of a large number of experiments by M. Miguel, of the Observatoire Montsouris, and shows the minimum quantity of the several antiseptics capable of preventing the development of germs and of adult bacteria in a liter of bouillon:

	Gms.		Gms
Peroxide of hydrogen	0.05	Arsenious acid	6.00
Bichloride of mercury	0.07	Sulphate of strychnine	7.00
Iodine	0.25	Boracic acid	7.50
Chloride of gold	0.25	Arsenite of soda	9.00
Bichloride of platinum	0.30	Hydrate of chloral	9.30
Cyanhydric acid	0.40	Salicylate of soda	10.30
Bromide	0.60	Caustic soda	18.00
Chloroform	1.00	Borate of soda	70.00
Bichromate of potassa	1.20	Chlorhydrate of morphine	75.00
Ammoniacal gas	1.40	Alcohol	75.00
Thymic acid	2.00	Iodide of potassium	150.00
Phenic [carbolic] acid	3.20	Marine salt	165.00
Permanganate of potassa	3.50	Glycerine	225.00
Acetate of lead	3.60	Sulphate of ammonia	250.00
Alum	4.50	Hyposulphite of soda	275.00
Bromo-hydrate of of quinine	5.50		

This system of treatment, based on the primary injection of H_2O_2 into the pockets as a ready method of cleansing them, and at the same time furnishing nascent oxygen to destroy the unclassified micro-organisms there present, and the subsequent injection of the zinc iodide, for it is well known stimulating and protective effects on the reparative material exuded, which is always ready for organization after being thus carefully protected, renders it almost certain that if careless probing or syringing of the pockets is prohibited, and the mouth is well cleansed with an antiseptic wash, a reproduction of lost tissues may be confidently anticipated.

In conclusion, permit me to say that this remedy, when used faithfully in conjunction with peroxide of hydrogen, the most valuable germ destroyer known up to the present time, arms us so well that I believe with expert handling of the probe to discover the concealed pocket, skillful removal of all deposits and edges of diseased bone, conjoined to an exact knowledge of constitutional needs, that we no longer need feel dismayed when brought face to face with a genuine case of pyorrhea alveolaris.—*Transactions American Dental Association.*

ARTICLE V.

ON THE DISPOSITION OF TIME AND ITS RELATION TO FEES.

BY A. W. HARLAN, D. D. S., CHICAGO, ILL.

The disposition of time by allotment to patients is, especially to a young dentist, very easy of accomplishment; but a time arrives in his history, if he has attained the practice which always comes to the earnest student and industrious worker, when it sadly perplexes him, and unless he is ususually methodical, he is apt to undertake a great many operations without much thought that one appointment may be so limited that he will be free for undertaking the next. This is a question which has given me no little concern, and the only reason I have chosen it for my theme has been to get a free and full interchange of views from gentlemen, many of whom are my seniors in age and experience, that in future I may be enabled to extricate myself from some of the dilemmas in which want of time may involve any of us.

Operating, as I have done for years, a certain number of hours daily at the chair, I am forced to a personal study of this subject. I have not gained much information from my brethern as to how they conduct a practice; so I have adopted my present method from necessity. My day usually begins at eight-thirty A. M., and I have found from long experience that as a rule it is best to have a male patient to commence with, and an appointment of one hour to one hour and a half is generally made. It is devoted to the preparation of cavities, cleaning teeth, or the removal of a pulp, or filling a root, and the insertion of the simpler kinds of fillings. It may be for the fitting of an artificial crown, or its adjustment. I do not at this early hour begin a large contour filling; first, because it frequently happens that persons who have broken a tooth, or who have the toothache, are liable to come in early, and they need a little temporary attention. Secondly, if they do, you can rest your early labors by having a chair in an adjacent room, and give the necessary moments which might not be possible were you intensely occupied. Another reason for engaging the first hour or so in the manner indicated, is that in cities it is frequently cloudy or dark so early in the morning, and of course that is a bar to the accomplishment of really fine operations. At nine-thirty A. M, or ten o'clock, the heavy work of the day begins; then the large fillings are started, and the difficult cavities are filled; or it may happen that I wish to fill three or four proximal cavities, operations that require extra good light. This usually requires one and a half to two and a half hours, the average being two hours. The next heavy work is then begun, which consumes the time up to one, or one-thirty P. M.; then lunch; after which perhaps another large filling, or very likely two; if the latter, the time up to four is consumed; if only one filling is made, I then have another appointment at three, for a simple filling or two, or three or four amalgam or tin fillings are inserted. Then I begin to change wedges, to attend to my regulating cases, to treat abscesses, cases of pyorrhœa, finish filling previously made, and attend to the numerous miscellaneous cases that every dentist of full practice has to see, examine teeth, make temporary fillings, extract a root or tooth, give advice, or write a perscription. Then I charge the labors of the day and make credits for cash received, make out bills and write letters, etc.

This ends the day—in winter at five-thirty P. M., and in summer at five-thirty to six P. M. The time is too long, but how to shorten it and meet the demands of an increasing practice, try experiments, study and keep *au courant* with all that is going on in the dental world, take a peep at current literature, attend societies, read papers that one has written, deliver a course of lectures or two, assist in organizing new societies or colleges, take needed recreation, attend to social and home duties, and still earn enough to run the financial wheels and save something besides, is the question. Seriously, to view this matter in any light is discouraging. The only way in which and by which any practitioner with a conscience can long be successful and do justice to his patrons, is to raise his fees. What shall be the basis for fees? I take it that the demand for services in a legitimate practice, by the public, is made by it to the professional man on account of his supposed skill, honesty, and ability to treat successfully the ills which negligence, accident, misfortune or ignorance has made it to suffer.

It the dentist satisfies the public, his patrons, that he does his level best in every instance, they trust him, they flock around him, and overwhelm him with their patronage. The greater number of those who seek the services of a dentist are not the possessors of large incomes. If it were so, in a few years a dentist might retire with a competence. How many have retired in Chicago? People with growing families and the possessors of moderate means are the most constant in their visits to the dentist. Families of large wealth are found in many places of recent origin. Many of them are, from their previous surroundings or education, unable to discriminate between the skilled and unskilled. They are restive and foolish in their unwillingness to bear with the necessary infliction of pain to treat or fill teeth properly. They are often unwise enough to offer to compensate for services of the most wearing and tedious nature in the spirit of dispensers of charity, or consider that they have done what was perfectly right in offering to pay half the bill for a receipt in full, and you are given the inestimable privilege at that cost of retaining them as your clients, or you are invited to collect through the courts, which is usually a poor way of obtaining one's dues on account of the comparative smallness of the claim.

I think that in disposing of time the most valuable should be allotted to those who appreciate one's labors, and who are willing to compensate for them. If one undertakes a difficult and delicate operation for people not able to compensate in the fullest manner, we are bound to do for those persons the same as though the full compensation had been received.

My plan of allotting time is to parcel it out to patients as far as may be without too great inconvenience, so that the best hours of the day are devoted to the cases needing most care and skill, having some reference to the appreciation of the patient and his willingness to make proper compensation for the service rendered. If I were to estimate the value of time at so many dollars per hour, should say that an hour from eight-thirty to nine-thirty is worth (according to the demand for time of the operator) about four to six dollars; from nine-thirty to one-thirty about five to eight dollars; from two to four P. M., about five to seven dollars; and four to five-thirty at three to six dollars per hour. I do not believe in the idea of receiving compensation by the hour, as it is unfair to patient and operator. Regular routine operations generally take up two-thirds of the time of every dentist. If he operates exclusively, he sees more patients daily than the one who spends one-fourth to one-half his time in the prosthetic department; the former, from habit, or application, or increasing dexterity, can make a larger number of operations daily than his brother who is not so constantly occupied. He learns from experience to manage his patients better, so as to expedite matters. He makes no false motions, everything is in readiness to work with, all his materials are at hand, his gold, or tin, or Robinson filling, his gutta perchas and plastics are all ready to be used. While the operator without system or method is getting his patient seated and his implements ready, the methodical operator has adjusted the dam, prepared a cavity and filled it, received his fee, and is ready for the next patient. System, order, and celebrity of motion tell in a long day.

If, on account of your method of managing a patient and the wisdom you acquire in repeatedly doing the same kind of operations, you are able to insert two fillings where your slower brother inserts but one, it is an injustice to you to be paid the same fee for the performance of double duty. I believe, also, that a habit ot making rapid operations tends to a greater thoroughness in the vast majority of cases. There is no uncertainty about the how or where of cutting. The operator who wishes to accomplish much has sharp chisels and good excavators, and his burrs are not dull. He spends little time in changing engine bits, because the cavity is well opened before he uses a burr; it is saturated with the obtunder, no matter what, quickly dried; a spoon-shaped instrument is dextrously applied, and presto, the cavity is ready for filling. When a cavity difficult of access and more difficult to fill is met with, even though it be small, if it consumes his vitality rapidly, the operator should make his fee commensurate with the skill required for its successful accomplishment, rather than on the basis of size of cavity or time required for its filling. Skill and knowledge and judgment are the factors to be considered in formulating a tariff of fees, and not time, nor materials, nor a desire to charge so much per diem.

In concluding this paper I desire to say that a patient has some rights which every dentist ought to respect. I do not permit any interruption by callers for appointments, or chance visitors; the only case which comes to me from nine-thirty to four which I stop to see (as a rule), is one of actual suffering. I make it known to patients on my appointment card that they can come at four and take their turn any day, and usually they acquiesce in this arrangement. A practitioner in a large city may lose a few patients at first, but those who make appointments appreciate the fact that they are required to spend only about one-half or two-thirds the time which they might have spent had the dentist been talking to half a dozen persons during the preparation and filling of a cavity, requiring at the utmost one hour for its completion. Time, to a dentist who has labored to perfect himself in all the details of his practice, is valuable; and he stands in his own light when he thoughtlessly or carelessly consumes it, to his own detriment and against his patients' interests, by endeavoring to make it up, as many are in the habit of doing, by improperly preparing cavities, impacting gold, finishing fillings poorly, or half doing many other important operations not necessary to enumerate, solely on account of a lack of system, method, or business-like habit of disposing of time.—*Independent Practitioner*.

ARTICLE VI.

ADAPTING ARTIFICIAL CROWNS TO ROOTS OF TEETH.

BY DR. GEO. W. SMITH.

(Read before the Mississippi Valley Dental Society.)

The practice of adapting artificial crowns to the roots of decayed teeth is the first method in which artificial work was introduced to the dental profession. And to-day there is no phrase of the mechanical department which promises greater success than the one we are about to discuss.

When we take into account the wideness of this subject, what it involves, and the possibilities that lie just beyond, I will scarcely be able to give you an outline in a paper like this. This method, I believe, if once brought to perfection, will give better satisfaction to the patient than any mechanical work yet discovered.

If we retrospect and acquaint ourselves with the early methods of pivoting teeth, we find that two kinds of pivots were employed, to-wit: wood and gold.

With some little alteration, the latter serves us at the present time, and doubtless will continue to do so; for we have no promise of good results when this gold, or platinum wire, is not employed, as it not only serves to hold the crown in place, but also adds strength aud stability, a point of great importance.

It is not our purpose to under-rate other modes of the mechanical art when we say that the signs of the times indicate that the profession is looking around for methods to replace lost dentures, other than that of inserting plates, or sacrificing part of the tissues and destroying contour without the least hope of replacing it except by artificial means.

The fact is well known to every dentist that, with many persons, the thought of wearing an artificial plate is absolutely repulsive. This class of patients would be willing to pay almost any fee if their teeth could be restored without a plate or the removal of the wrecks remaining in the oral cavity.

The failure in treating and filling successfully the natural root was the greatest obstacle to be overcome in the adoption of a method which avoided plate work. But the rapid strides made by our progressive and ever advancing profession have at last overcome these obstacles, and by the improvements made we may now restore broken down crowns by setting gold bands, and gold and porcelain crowns on roots almost entirely destroyed by caries. Roots that are looked upon as unwelcome guests in the mouth, and that once would have been considered useless, may now be made not only to serve in keeping the muscles of the face in place, but also as good and efficient masticators.

In the erection of a grand and stately edifice, the first and most important matter to engage the attention of the architect is the foundation upon which the superstructure is to be built. So in mounting these porcelain crowns, the root, our foundation, must first be examined to see whether or not it is sound and healthy. It should be treated until it is free from all obnoxious and fermenting gases.

The pulp cavity may then be enlarged with suitable instruments, to within one-third of the apex, to receive the pivot. It has been my practice in the crown which I have originated, to cut the root short to the gum, if not slightly under the free margin on the labial surface, while on the palatine I leave it projecting slightly, if possible. I then fill the upper third of the root with fosseline and surgeon's cotton. I take a small portion of the fibre, tease it on glass, mix it with the cement, and with small nerve instruments I carry it to the apical foramen, completely closing it. The cotton serves to carry the cement to the desired point, and when packed in the root, will set perfectly hard, and completely exclude any egress from the canal through the apex, which is the ultimation in all root filling.

I then take a cast from the mouth, followed by articulation, after which I select a plain plate tooth, with shade to suit those with which it is to be associated, and grind to suit the prepared root. I now select the pivot of gold or platinum, the end of which I flatten, punch holes to suit the pins in the artificial crown, and press the end on as backing. I invest this, and solder the wire to the pins. If the wire is is not quite shaped to suit the hole in the root it can easily be adjusted.

Place the pivot and crown in position, and regulate the contour and articulation. Now take sheet tin, press around the palatine surface, while the tooth is in position; let the tin cover the root, also the palatine surface of the tooth. This will give the outline or pattern, from which the gold band may be cut and shaped to the root and crown; secure the band with "wax resin" and remove altogether. Invest and solder. When polished, the root, together with the crown should be sponged off with alcohol, the mouth kept dry with bibulous paper or a napkin, until the cement is prepared for the pivot.

Mix enough of the fossiline to fill the root, which should be put on the pivot and band, and then carry them up in position and hold firmly until it hardens. This crown is not only artistic, but serviceable; and when set, gives entire satisfaction, of which many testimonials can be had in our city at the present time.

Within a few years past, we have had a crown presented to the profession by Dr. Richmond, made of gold. This crown has found favor with many operators as a substitute for broken down molars. It meets a demand that cannot be supplied successfully, as yet, by any porcelain work for molar teeth.

The original method of setting this crown, I believe, was to dress the root, or that portion of the tooth remaining, so the crown would fit tightly when pressed to the margin of the gum. To do this it was necessary to dress the stump on which the crown was to rest, then take a cast, followed by articulation, after which we press tin foil around the stump to get the circumference of the remaining tooth, from which to make the band. The gold band may be made to fit the stump accurately by passing wire around the band, and passing band and wire over the root on which the crown will finally rest, and with the pliers, twist the wire till it fits tightly; then remove and solder, and again return to the root. Now build up with wax, and have the patient close the mouth, which will give the space to be filled with gold.

The easiest and best method in making the top is to melt the gold down on thin platinum, and after soldering to the band, it may be shaped with a file to suit articulation. An opening should be left in the top for the escape of the surplus cement, which may finally be filled with gold foil.

The dental profession can boast of many different artificial taps and varieties of porcelain crowns, all artistic, and many that may be relied on for utility and service. And we are under lasting obligations to those who are interesting themselves so energetically in behalf of the profession. But the crown that should be adopted, is the one that embraces the combined elements of *strength* and *beauty* —strength to resist the pressure to which it is usually exposed, and beauty to make it take as far as possible the place of the natural teeth.

I have now given you the results of my experience, and the method which has given me the greatest satisfaction; so that it is in order for you to relate your experiences, and enter into the discussion of their merits.

Boyle, the eminent English chemist, said that if every artist would but discover what new observations occurred to *him* in the exercise of his trade, philosophy would thence gain innumerable improvements. It is just so with our profession. All knowledge began from experience, therefore all new experience is the beginning of new knowledge.

Each can accomplish much for himself by energy, hard work, and close application to his profession, but not all. So closely are we related to each other, and so different are our professional experiences, that the greatest results are attained only by our meeting together, comparing notes and experiences, and discussing, thoroughly, the subjects that are of vital importance to our profession. Thus will the great excellencies of each one, in any particular line, be made the excellencies of all, which is a duty we owe, not only to ourselves, but to the public, our patients. In this light there is no policy so poor as selfishness. He who seeks exclusively his own interests will never find them, for they lie not in the path he is pursuing.

When the interests of each, and the interests of all of us, are no more separated in thought and deed than they are in reality, then will the truest, surest, most permanent progress be made in our most worthy profession.—*Ohio State Journal of Dental Science.*

ARTICLE VII.

THE AMERICAN MEDICAL ASSOCIATION —SECTION OF ORAL AND DENTAL SURGERY.

The meeting of this society at Washington has been largely attended this year, it being claimed that over thirteen hundred men from all parts of the country had registered as delegates.

The town seemed to be invaded by doctors, and the best hotels were packed until "standing room only" might have been displayed outside the dining rooms. Among so many men you must not be shocked if there were some who forgot their gentler duties amid the dizziness resulting from the novelties to them of the entertainments, scientific and gastronomic, the receptions, the excursions, and the refreshments. But few apartments were sufficiently large to comfortably contain the throngs from everywhere, and an irrepressible desire to get to the front was manifested by many who, no doubt, after experience and time have better schooled them, will be more humane and patient, if not more gentle and genteel. The courtesies and homage to the fair wives, daughters and ladies of the members' families were not overdone; in some cases, indeed, they were doubtless deferred to more convenient, if not more auspicious, opportunities. Alas, all men are human, and some at least who claim the M. D. are not lifted above their less skilled fellows in this world of many callings.

These strong contrasts, however, are the most notable exceptions, and if erudition, culture and perfection of manners do not always entwine in the one character, still, like the three graces, they rarely are pictured except together.

A few men of coarse minds and cruder cultivation will always float as a scum upon the top, which should be removed if a test of the general merit is to be applied.

The interest in the proceedings was very intense, and the results must necessarily be elevating to the profession as a whole. So important has the healing art become, that a division of the main body into sections seems to have been a necessity, and while this has uncovered many novelties of thought, the plan will yet require much executive ability to keep the powers within proper and profitable limits.

The running of a society of the size of this one, is by necessity only possible with machinery of such strength as to appear, when observed in relation to other societies, cumbersome and heavy. For the better management and smoother play of this machine, rings are largely introduced in its mechanism, and endless chains are not unfrequently formed by a junction of these. With proper application of oil and an occasional touch of plumbago, which is apt to be rubbed off by the unskillful engineers, the noise and friction are kept under subjection. Woe, however, to those who fail to attend these complicated duties. If the journals are heated, they at once show defects in the apparatus, and these are numerous and dangerous; for, the corrections of the faults are apt to involve a change of the engineers, whose only pay is the quenching ot their ambition for offices, and the transient publicity that they derive from these positions of honor.

An example of the curious ways in which the general nominating committee performed its duties, was afforded by the Section of Oral and Dental Surgery having a chairman assigned it, who disclaimed all knowledge of the nomination, and upon the section proposing to take an informal ballot, he made some remarks that we construed to be equivalent to a resignation. For secretary there was given to the same Section one who it is claimed never had been to one of its meetings, and was not even present at this session. "*Sic transit gloria.*" The general association at its final Session passed a resolution, to be adopted as an amendment next year, that each section hereafter propose the names of its own officers to the committee on nominations.

Other sections were said to be under the management of parties adverse to the prominent members of the societies of specialists, of which there are several besides dentistry. In the latter it was believed by some that hope of election to high places in the American Dental Association was the only reason for the absence of those who would have gladly joined hands in the work there, if not intimidated by the possibility of its depressing the ardor of friends for their nomination in the A. D. A.

What pitiable poverty this petty planning proves, and how puny must be the outlook of the world to those who so preserve their perilous poise while posing as perfect patterns before their fellows. It is a shallow plasure indeed if such trifles can destroy it. Can it be that the time for the office to seek the man has altogether passed, even among professional men ?

The struggle for any advancement, save through honorably acquired ability, is so generally followed by a corresponding downfall, that one cannot but wonder at the blindness of men who would aspire to positions above their abilities to fill. If these defects are so apparent on the level of the floor, how much more conspicious would they be in the chair of the presiding officer.

There are likewise other serious troubles to be met in the very limited membership which the above mentioned section will admit of, there being but a dozen or so in attendance. Upon the part of these representatives there was a laudable manifestation of a determination "to raise up those who fall, and finally to beat down Satan under our feet." Papers were read that took high grade views of the duties of the dental surgeon as a member of the broad fraternity of the healing art, and the discussions were not lacking in boldness of conception of the proper methods of discharging the functions of this branch. At least this association may become another of the many means of advancement, and its infancy as yet, should shield it from too harsh criticism or hasty demands for lusty strength.

Hints were freely made as to the doubtful manner in which one of the delegates had obtained the right to be present, and if these were correct it cannot be too soon to expose an error that is by many conceded to be the bane of the dental profession of to-day. Degrees purchased by subscriptions of money to Colleges, or services rendered institutions weak in their powers of attraction to their fonts, will not alone render their possessors open to criticism, but likewise retard, if they do not degrade the Section's work by the reflection they may arouse as to the shallowness of the channels through which the right of membership may be attained. Perhaps an investigation might at least raise the confidence of some, as to the altitude of the standard reguired for the privileges of fellowship. So it will not be amiss to hope that these hints may be formulated into charges that will be brought through the proper channels to this association as a committee of the whole.

Agitation may endanger the life of the section, but what is the serving of that compared with the dues to truth and justice? Young trees are mostly benefitted by fearless and thorough pruning. . Excresences of an unsightly nature had better be cut away before they disfigure the whole growth, and the wisest of men has given us the rule that to "spare the rod is to spoil the child."—T. C. S. in *Dental Practitioner*.

ARTICLE VIII.

NEW REMEDIES.

BY DR. WM. A. PEASE.

A paper appeared in the January number of the *Dental Register*, 1882, which I read before the Mad River Dental Society, entitled, "A New Departure." That paper grew out of the unsatisfactory results in the treatment of teeth from which the pulps had been more or less perfectly removed; and of that chronic, irritable condition, often cystic, which surrounded the apices of the roots. And of numerous experiments, observation and failures which had convinced me that the most thorough antiseptic treatment of dead pulps, or remnants of them, in some mouths did not antisept. That after a time decomposition would be resumed, and gas and irritation would be the result. Still there was a class of persons of such robustitude; so little susceptible to irritation; whose absorbents were so active and healthy; in the sockets of whose teeth dead pulps created little or no irritation; that it made the antiseptic theory seem plausible, while failures in the numerous teeth of irritable patients were regarded as exceptional—due to improper treatment. These cases were too numerous to be satifactory to me, and I began to regard the treatment as unphilosophical, and then to experiment to see to what extent the antiseptic treatment was successful. Pulps deadened with arsenic, fully exposed, and covered with carbolic acid, and then covered with a filling, soon gave trouble. Others, treated in the same way with wood creosote, were equally troublesome, and others punctured with a broach, to enable the carbolic acid or creosote to be absorbed, ultimately gave trouble. Pieces of the best salted and smoked meat, bathed with carbolic acid or creosote, when subjected to moisture and the temperatuae of the blood, soon decomposed. These experiments, and others, were repeated in various forms until I became convinced the antiseptic treatment did not antisept. In the presence of these facts what was to be done? Remove the pulp as far as possible? That was already the practice; but it was often incomplete in the curved roots of the molars, and there were often fragments left in the single rooted teeth. Under the old theory the remains of the pulp were supposed to oxydize —a slow process of cremation; under the new, they are attacked by living organisms, which hasten metamorphosis by their individual action. The results of the processes are the same; but they have a different initiation. Now it is believed that carbolic acid destroys these organisms; and probably it does, and the putrefactive process is held in abeyance for a time, to be revived by a succeeding visitation. Just how that visitation finds egress to a plugged tooth, passes some sort of an impedient, more or less impregnated with carbolic acid, to reach a fragment of partially carbolized pulp, is not easily explained. Certainly teeth are extracted that have two distinct stinks; the one from a partially filled root, from which the smell of carbolic acid has not entirely left; the other from putrefying animal matter behind it. It is supposed some one will find the key to unlock this enigma, but at present we are left to various conjectures.

If my memory serves me, at the time I read that paper, no means for removing or rendering the remains of the pulp inert were proposed; certainly not the one now used. That paper was tentative. It proposed a theory to be worked out by many experiments by many men. As I have no copy of that paper, and have never seen it in the *Register*, I am embarrassed now by not knowing what it contained.

At the last meeting of the Mad River Dental Society I had a paper, which was not read, relating to some conditions of the dentine immediately preceding the death of the pulp from natural causes, and after decomposition had set in, which bore upon and threw some light upon this subject, but which is too long to be inserted here. I must be content after another year of experiment and of watching results to record the means I have found the most effective, which are believed to be valuable and novel. They consist of iod. potass et aqua calcis. both strong, the strength to be determined by location, patient, and what is required. Where there is much tissue to be destroyed the action of the agent may be facilitated by probing and lacerating it with broaches and pumping the solution into the substance of it, or by letting it be absorbed by gravitation or capillary attraction. This will be chiefly necessary beyond the curve of the roots of the molars. Several applications may be made when necessary, until the tissue has become saponified, when it generally can be washed out by a syringe being more or less soluble, or by arming a broach with sufficient cotton wet in the solution and then passing it down the canal, twirling it around and removing it. Sometimes a broach made from a splint of the bamboo, which is very tough and flexible, is better. Then, if any remain, it is impregnated with potash, saponified, inert, and a most uncongenial *nidus* for parasities, while the iodine would evaporate and gently stimulate the absorbents beyond the foramen. This method leaves the dentine clean and white, the passages leading to the crusta petrosa are not dark as when they are infiltrated with carbolic acid. As an adjuvant to them the bromide of potass may be freely used of any strength desirable, as it is the best sedative of irritative mucus membrane and of the nerves, which terminate immediately beneath it, we have.

Here, let me add a postscript, but no way pertinent to the subject, that iodide et bromide potassæ in suitable solution are the best mouth washes for certain conditions we have, may be used as indicated. They cleanse the teeth well, and have a salutary effect on the gum. One, or the other of them, will, after a few applications, subdue the tenderness in cavities near the gum; as well as those unstable and fugitive pains in irritable and hysterical patients; no injury is caused by swallowing a little of either, and for the hysterical a full dose of the bromide is often beneficial.—*Dental Register.*

ARTICLE IX.

ON THE INFLUENCE OF MICRO-ORGANISMS IN THE PRODUCTION OF CARIES. (Continued.)

BY ARTHUR S. UNDERWOOD, M. R. C. S., L. D. S., ENG.

(Lecturer on Dental Anatomy and Physiology at the Dental Hospital of London Medical School, &c)

The next experiment we shall describe is a repetition of one described by Dr. Miller, with this extension, that it has been carried out under septic and asceptic conditions. Two 8–oz. bottles were half filled with saliva; to this was added bread in both cases, and in one carbolic acid; into these were introduced fragments of healthy teeth extracted for regulation and split. The saliva was the same,—*i. e.*, from the same mouth,—and taken at the same time, the bread from the same piece, the teeth were halves of the same tooth; both fluids were neutral. The bottle not containing carbolic speedily became the scene of an active growth of micro-organisms, for the greater part micrococci; a thick felt of this growth formed at the surface of the fluid. At the end of three months the surfaces of the teeth in the impure flask had become softened, but not discolored: the surface of those in the pure flask was unaltered, the fluid in the pure flask was neutral, that in the impure one strongly acid. Thus in the impure flask acids were generated as well as germs, or, as we think seems more rationally to express it, by the germs. The teeth from these fluids are here for your inspection. Lastly, a number of teeth are here for your inspection in which a change has certainly taken place after a long immersion in septic fluids.

It is plain, then, that whereas in the absence of germs no change takes place that could be supposed to be caries, and that in the presence of germs a change does take place, which, although it would render our views more cut and dried to call caries, we are bound to confess is a very weak caries if it be caries at all, and further, remembering that unmistakeable caries does affect natural teeth on artificial dentures which have no connection with the vascular system, we are led to inquire whether organisms, that are undoubtedly the prime factors in the production of other diseases afford us an anology of a loss of power when placed in strange conditions. The answer to this inquiry is very plain and direct, and completely in the affirmative.

Pasteur, Nægali, and other equally reliable authorities, have discovered that special organisms alter their character when grown under unusual conditions. Even though they continues to grow and reproduce their species, their special properties weaken and die out in the unnatural surroundings. Thus, to take a couple of typical instances, Pasteur, by growing bacillus anthracis at a peculiar temperature, "attenuated" the organism to such an extent that he was able to vaccinate animals with—that is, he rendered this special bacillus, which, in its normal condition, would, if inoculated into an animal, produce anthrax, practically inocuous by changing its surrounding conditions. Again, Nægali has been able so to modify the properties of a lactic acid producing bacterium that it produced an ammoniacal fermentation. Lastly, certain pathogenic bacteria require a special soil in which to grow and a special temperature, otherwise the growth ceases altogether. Moreover, the presence of a number of extraneous organisms does in some cases hinder the active growth of others. A similar difficulty has attended the attempt to grow the organisms of gonorrhœal ophthalmia, and such instances may be almost indefinitely multiplied; the conclusion is, however, pretty plain, namely, that special organisms require special surroundings to display their special activity, and we are inclined to think that in the case of the micro-organism of caries a living mucous membrane is one of those conditions.

In view of these facts we feel ourselves justified in claiming to have established as a permanent addition to dental pathology the fact that micro-organisms of a special form do play an important part,—nay, more, that they are an essential factor in the production of caries. We think many of these experiments show that these organisms do much of the work—at any rate, as far as the removal of the lime salts goes—by the aid of an acid which they produce. We feel convinced that the process, to be effective, must be carried on in a living mouth, probably because that is the only situation in which the special germs are really active. Analogy seems to warrant this deduction; but before concluding we wish to impress upon the meeting, and through the meeting upon all who take an interest in the matter, that all we claim for the germs is, that without them and their products the process could not go on at all. The essential element that was not present in our artificial experiments is present in the mouth; it is possible, and we consider, from the analogies quoted above, *probable*, that this important element is the living buccal mucous membrane as a scene of operations, and the constant succession of the proper germs. Enough has, however been laid before you to induce us to hope that this Society will endorse the statement made by us in the August of 1881, and repeated more fully now, that micro-organisms play an important part in the production of caries, and that the dental pathology of the future must include them amongst the most powerful factors in production of this disease.—*Dental Record.*

MEETING OF DELEGATES.

Delegates to the NATIONAL, and any others who may act in a representative capacity, will meet in Washington City, July 22d, at the Ebbitt House where reduced rates have been made. Reduced railroad rates may be obtained by combination of delegates from the same State or section.

Everything points to a most interesting meeting for organization, enough States have already elected delegates to make the meeting prominent. Favorable responses from every section of the country have shown the time to be most opportune for such a move and the place to be most acceptable.

B. H. CATCHING, *Correspondent*.
ATLANTA, *June 14th*, 1884.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The Second Annual Meeting of the National Association of Dental Examiners will be held at Saratoga Springs, New York, on Friday evening, August 8th, 1884.

All Boards of Examiners are urgently requested to send representatives to this meeting as matters of great importance are expected to be brought before it.

GEO. H. CUSHING, *Sec'y*.

AMERICAN DENTAL ASSOCIATION.

The Forty-Fourth Annual Session of the American Dental Association will be held at Saratoga Springs, New York, commencing at 10 A. M., on Tuesday, August 5th, 1884.

GEO. H. CUSHING, *Rec. Sec'y*.

PENNSYLVANIA STATE DENTAL SOCIETY.

The 16th Annual Session of the Pennsylvania State Dental Society will be held at Wilkers Barre, Pa., July 29th, 1884, and continue in session three days. The meeting will be held at the Wyoming Valley Hotel, which will accomodate three hundred guests. Rates have been reduced from $3.50 to 2.50 per day to delegates, and their families. Excursion rates over the following Rail Roads: The Leheigh Valley will sell to W. B. without special order. The Bloomburg Div., of Del., and Lac. and West, will sell regular excursion tickets from all points on the line. The Philadelphia, Reading and Penna. Central, Northern Central, and Phila. and Erie will sell special tickets over their lines, orders for which (or other information) can be obtained by addressing,

W. H. FUNDENBERG,
Cor Sec.
958 Penn Ave., Pittsburgh, Pa.

EDITORIAL, ETC.

DENTAL EDUCATION.—The subject of dental education has engaged the attention of the profession from the time dentistry emerged from the condition of a mere trade to its present status.

Almost every number of the various Dental Journals, and the proceedings of every Dental Society, present essays and editorials, giving the individual views of the writers, many of whom suppose that the plan they promulgate is the only feasible one, while others declaim against any system which is not propagated by themselves, or in the carrying out of which they have not a part. Another class of writers or speakers, condemn all methods of collegiate instruction, simply because they have not enjoyed such privileges themselves, being content to pursue the beaten path, old and absolute though it may be, which they have followed for many years, without an effort to improve with the profession they practice.

Although great diversity of opinion may exist even among those qualified to judge, as to the manner dental schools should be conducted, yet a large majority of the most eminent dental practitioners recognize the fact that the *reputable* dental schools at least, are doing all in their power, and are accomplishing a noble work, equal in all respect to that emanating from the schools of the kindred professions. That abuses have been perpetrated by certain schools, some of them schools whose previous standing should be a guananted against any retrogression, is beyond question, and this fact has caused certain Journals, independent and outspoken, to publicity notice what has for a long time been a matter of common report. The passage of State laws regulating the practice of dentistry, and the appointment of State examining boards to carry out the provisions of such laws, have been instrumental in bringing about a surveilance, which must be beneficial, and act as a check against the indiscriminate issuing of diplomas, withou regard to time of study and qualification.

The Buchanan system of selling diplomas broadcast, may not now be pursued with the unblushing effrontery which characterized that fradulent scheme, except in the well-known Wisconsin case, but a practice which has very little more to commend it, has been pursued by some schools of longer existence, and which has led to the present agitation.

The best interests of the profession demand that every dental school should not only publish its requirements for graduation, but should strictly adhere to such requirements.

If the revenue derived from an upright, honorable course, such as should be pursued in conducting every reputable dental school, is not sufficient for its support, then it would be greatly to the honor of all concerned that such a school should cease to exist, rather than attempt to prolong its life by graduating students irregularly.

We trust that the good effects even now apparent in the administration if the State laws regulating the practice of dentistry, may not only continue, but increase, and that the State Boards of dental examiners may, by the exercise of the powers conferred upon them exercise great good, and correct many irregularities which may now exist in the method of Collegiate instruction.

MONTHLY SUMMARY.

DENTAL IRRITATION CAUSING SPASMS.—At the meeting on March 20th, of the Harveian Society of London, Mr. Henry Sewill read a paper on Spasms of Muscles of the Face and Cataract due to Dental Irritation. The subject was a middle-aged lady, laboring under inveterate neuralgia, who during late years had suffered from a series of alveolar abscesses, and in 1881 had complained of recurring pains in the right eye, complicated since January, 1882, with persistent spasm of the right side of the face.

In July, 1882, partial loss of sight from right cataract, and partial closure of the same eye from spasm of the orbicularis, were superadded.

In July, 1883, at the request of her medical adviser, Dr. W. Hoffmeister, she consulted Dr. Ferrier, who, suspecting the symptoms to be due to dental disease, prevailed upon her to submit to the extraction of the offending teeth. Mr. Sewill found in the upper jaw the stumps of some molars, and artificial bicuspids, incisors and canines attached to a vulcanite plate, which had not been removed for years. The right canine was completely broken down, and pus exuded from several fistulous openings in the gums. The lower teeth were hidden beneath an enormous mass of tartar.

The treatment consisted in the extraction of all the upper teeth at two sittings, and in gradual removal of the tartar from the lower teeth. Within two days of the extraction the facial spasm entirely disappeared, but no change took place in the damaged lens.

Mr. H. Power had lately stated in a paper read before the Odontological Society that dental lesions are very frequently the cause of diseases of the eye.

Threatening glaucoma, especially when associated with ciliary neurosis, and with obscure temporal and orbital pain, mydriasis, myosis, sudden paralysis of some of the orbita, muscles, and loss of sensation in the absence of cerebral symptoms, phlyctenulæ and corneal ulcers (especially in children), sudden failure of accommodation and exophthalmos, were conditions calling for careful inspection of the teeth. To these should now be added cataract.

Mr. Power had pointed out various ways in which irritation originating in the teeth might reach the eye: (1) Inhibition; (3) trophic or vaso-motor influence; (3) extension of neuretis; (4) reflex irritation or sympathy.

The case recorded above was probably an instance of trophic disturbance.

The President called attention to the frequency with which the ear was affected from the same cause; the subject was fully discussed in a recent work by Dr. Samuel Sexton, of New York.

Mr. F. Treves referred to cases similar to that brought before the Society, which had occurred in the practice of Mr. Hilton and Dr. G. Johnson. Addressing himself to the anatomical aspect of the question, he criticised the theories suggested by the author for an explanation of the nervous mechanism at work. The case might lend support to the view that a nervous communication existed between the second division of the fifth nerve and the lenticular gangloin.

Mr. Juler, from observations upon a large number of cases in which eye affections were associated with disease of teeth, was of opinion that the latter were even more commonly the cause of ocular and intra-ocular lesions than Mr. Sewill appeared to consider.

As illustrative cases he would mention that of a young lady, aged seventeen, who was sent to him by Dr. Jennings, of Notting-hill. See was otherwise in good health; the right eye was slightly hypermetropic, but the vision bad, and the ophthalmoscope showed patches of recent choroiditis at the posterior pole of this eye.

No cause could be found for the lesion until her dentist, Mr. Percy May, informed him that she was suffering from a carious tooth in the left upper jaw. The tooth was extracted, with considerable improvement in the vision.

Another case had occurred lately in a young lady who was sent to him from Bedford. In this case the vision of the left eye was reduced to the perception of fingers only; she had evident symptoms of inflammation of the ciliary region, and the vitreous was crowded with large membranous and fine floating opacities.

No cause could be found for the ocular trouble until a history of neuralgia led to the discovery of carious teeth. She had promised to have the teeth extracted, and Mr. Juler had no doubt that the eye would afterwards improve.

A delicate woman, aged fifty, consulted him at the Westminister Ophthalmic Hospital a year ago on account of persistent jactitation of the right eyelids. The case was an interesting one, inasmuch as there was a "point of election" just opposite the infra-orbital foramen, over which firm digital pressure had the effect of immediately stopping the movements. A carious tooth in the upper jaw of the same side was extracted, and with it disappeared the facial trouble.—*London Lancet.*

A NEW REMEDY FOR SPASMS.—The *Med. Central. Zeit.*, of July 15th, 1882, publishes the result of experiments instituted by Dr. Schifler, of Berlin, for the purpose of determing the therapeutic value of the *extract of Guachamaca*, a tree indigenous on the Apuche mountains. As a specific for all spastic conditions of the motar apparatus we so far possessed, in reality, one remedy only; curace, which, however, on account of its danger, and the uncertainty of its action, as well as of the remedy itself, has mostly been used for physiological experiments alone, and, perhaps, occasionally in tenanus.

Guachamaca extract, prepared from the bark of the Quebracho plant, which belongs to the same class as the Oleander (Nerium ol. L.) and of which latter the skin between the tree and bark is also poisonous, is a remedy which, while not so dangerous in its effects, is far more reliable and uniform in its action, and can beside easily be procured pure and genuine, and of always equal strength, as it is by no means rare.

Schifler experimented with this drug, and made his observations in the clinic of Prof. Frerichs. He employed the remedy in solution, in the dose of ⅙ of a grain, and by the hypodermic method, in cases of tonic and clonic spasms of the muscular system, and always with a very good effect. He noted also that, administered internally, no matter in what solution, the drug was as little absorbed by the mucous membrane of the alimentary canal as curare is.

Should further trials with this remedy prove invariable as successful, or at least frequently so, as was the case in Schiffer's experiments, we would at last possess a reliable specific for all spasmodic affections of muscles and motar nerves, a drug, the physiological action of which would be exactly opposite to that of strychnine and similar remedies.—*Med. and Sur. Reporter.*

ETHER.—In the *Lancet*, Dr. H. Bendelack Hewetson discusses the relative value of ether when prepared with "rectified" or "methylated" spirits of wine. The author states that there is a great difference between them. That prepared with rectified spirits has been found by those who have used it less safe and less desirable, producing more sickness and laryngeal spasm in certain cases in which there is a tendency to such complications. Of the use and applicability of the methylated ether—as the safest anæthetic known, where carefully administered by means of Clover's inhaler—he can speak strongly, as the result of daily observation. It is a very ordinary circumstance to accupy eight seconds in producing complete anæsthesia, without a struggle or a cough, and it is by no means extraordinary for a patient to be "fully under" *within* the minute. In the case of short operations upon the eyes, and the like, it is hardly ever necessary to reapply the inhaler after it has been once removed for the operator to commence, the patient remaining sufficiently anæsthetic for an operation such as mentioned to be completed without hurry. Anæsthesia can be prolonged with equal safety even so far as to keep a patient in labor completely under its influence for upward of *four hours*, the longest time which has happened in my experience. Methylated ether is, I consider, from this point of view, the safest and cheapest anæsthetic at present in use.—*Med. and Surg. Reporter.*

EFFECT OF TOBACCO ON BOYS.—Dr. Edward C. Otis says: that the evil effects of tobacco upon boys which can be said to have been fairly proved by observation, are:

1. An interference with and impairment of the general development, mentally and physically. Probably it does this by retarding progressive cell change and impairing nutrition. In an adult this development has been attained; consequently he can smoke with impunity so far as this effect is concerned, when the boy only does it with injury.

2. The tobacco heart. This likewise happens to the adult; but is, I should think, more likely to happen to the youth, and with graver result, because his is such an unstable age, physically. For this same reason the other injurious effects are more liable to be intensified in the youth.

3. Defective muscular co-ordination. I have but little proof to show that this condition is more than temporary, continuing only while the tobacco is used.

4. It reduces the intellectual power of the boy. It does this either by opposing mental application and effort, or else by producing deterioration of the intellect—probably both to a greater or less intellect.

5. It impairs the memory. What proof I have adduced seems to show that this is a permanent injury.

6. It may cause defective vision and also irritation, more or less chronic, to the external part of the eye.

7. It may unduly excite the sexual system and lead on to excesses. I have no positive proof of this, but my observation among boys rather points to it.

8. Irritation of the mucons membrane of the mouth and throat, more especially in cases of cigarette smoking.

9. It may impair digestion and produce other derangements, such as habitual uneasiness, hypochondriasis, etc. —*Boston Medical and Surgical Journal.*

EXCISION OF THE TONGUE.—Mr. Croly, of Dublin, performs the following operation for cancer of the tongue, even when the disease is situated in the anterior portion of the organ. He first ligatured each lingual artery close to the hyoid bone.

through a curved incision, reaching from the symphysis down to the hyoid bone, and up and back to the angle of the jaw. Through these incisions he withdraws the tongue, as in Regnoli's operation, and removes the requisite amount of it by the benzoline cautery. Lastly, he divides the gustatory nerve where it lies along the inner border of the jaw-bone.—*Med. and Sur. Reporter.*

TRIAL PLATES FOR THE LOWER JAW.—These often give us a vast deal of vexation, because, if not made stiff, they bend and displace the teeth they carry, much to our annoyance and loss of time. To obviate all these troubles, Dr. Samuel Wardle recommends that the plate be made of modeling composition, (medium grade) and strengthened with twisted wire. Ordinary iron wire is annealed and two strands twisted together, the result being a wire that looks like a thin screw. This is cut into lengths of about three inches and kept on hand for ready use. Two pieces are generally required to stiffen a plate. Bend them to suit the form of the plate, warm in the spirit flame or gas jet, and press them into place in the composition. When cold, the plate is as stiff as thick lead; made in one-third the time and without injury to the model. Try it. —*Dental Register.*

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ARTICLE I.

SOME OF THE DRUGS USED IN DENTISTRY.

BY CHAS. W. GLASSINGTON, M. R. C. S., L. D. S., EDIN.

(A Paper read before the Student's Society of the National Dental College.)

The subject of my paper this evening is one which is of great value to the Dental Surgeon, and yet during the two, three, or four years a man takes to qualify himself in Dental Surgery, it receives little or no attention from him. This is partly the fault of the student and partly the fault of "the powers that be." A student desirous of obtaining the Diploma of L. D. S., Eng. is required, amongst other things, to attend one course of Materia Medica, and during that course what does he learn to help him in the profession he is ultimately going to follow? Little or nothing at all. He will, if he be diligent enough to attend all the lectures, and attentive when he does attend them, learn that iron, matico, and tannin are hæmostatics, and consequently useful in hæmorrhage after tooth extraction. That arsenic is used for destroying exposed pulps; that carbolic acid and creasote are largely used by dentists; that croton chloral, chloride of ammonium, and tincture of gelsemium are, good for neuralgia; and other important facts. But of the action of these drugs in particular relation to the teeth he gets no information beyond what he acquires during his practice at a dental hospital, or from what he reads in the dental journals, or from the only work (that I know of) on Dental Materia Medica—that by Mr. Stocken. Again, if he reads the text books on Materia Medica, he will find passages like this:—"Externally applied creasote allays toothache depending on caries." Now, although this is true to a certain extent, how very meagre that information is when we know how largely this drug is used by dentists.

During my late appointment as House Surgeon at this hospital, I was on several occasions much impressed by the ignorance shown by some of the students of the different drugs they were using. In dressing "a dead tooth" it was a matter of total indifference to some what they did it with. Eucalyptus, carbolic acid, or creasote, whichever they thought of first, but why they used one or the other they had no definite reason. Now this I maintain is the fault of the "powers that be," and the sooner a chair of Dental Materia Medica is founded at all our dental schools the better it will be for the future of our profession.

I shall endeavor as far as I can to make this paper as practical as possibie, and give you very little theory. I do this for two reasons, viz., that time will not permit me to say much upon each drug; and secondly, it will not make you think that I am giving a lecture.

The first drug I will put before you is ARSENIC, and is one on which alone anybody could write an interesting paper for discussion. Arsenic is an irritant, escharotic, and powerful antiseptic, the latter fact being proved by the injection of bodies for dissection. I do not intend starting the question whether arsenic should or should not be used for destroying pulps, although, for my own part, I am quite of opinion that when a pulp or part of one can be saved it is our duty to save it. We all know that to preserve the life of a tooth we must preserve the life of the pulp and of the peri-dental membrane, and in using arsenic we destroy one if not both. Broadly speaking, the only indication I shall put down for its use, is when the whole of the pulp is inflamed and pus has formed.

Assuming we have decided to destroy a pulp with arsenic, let me impress on those who are just commencing their hospital work the following hints:—

1. Apply the rubber dam.

2. Carefully dry the cavity first with cotton wool or bibulous paper, and afterwards with the hot air syringe.

3. If the exposure is small enlarge it with sharp excavators, as arsenic applied to a small exposure only increases the inflammation and pain.

4. Apply the arsenic (about the 1-16 gr.) on a piece of cardboard sufficiently large to prevent any pressure on the pulp, and soaked either in carbolic acid or creasote, cover with copal varnish, and fill with Hill's gutta-percha. I prefer this to mastiche, as you are liable to drag the mastiche away when taking off the rubber; besides which it is a safer filling. Whatever fluid you use to convey the arsenic to the cavity, be careful not to have an excess, as you are liable to have this excess squeezed out and with it some of the arsenic.

5. Do not use it in young children unless you know the tooth is fully formed, for in destroying the pulp of a growing tooth you stop its growth.

6. Should a pulp be greatly inflamed use an application of creasote, tannin, and morphia, to reduce the inflammation before using the arsenic.

7. Do not use it in excess as the effects spread to periosteum, bone, and neighboring pulps, and may cause their destruction.

Mr. W. E. Harding brought a case before the Odontological Society on December 5th, 1881, in which he had carefully treated a pulp with arsenic, and in three days the patient had all the symptoms of arsenical poisoning.

Mr. Coleman has lately brought before the notice of the profession a method of treating so-called "dead teeth" with arsenic. In those cases where the pulp has sloughed away, the canal cavities filled with puriform fluids, the dentine itself being moist and very offensive, and as a rule, accompanied with periodontal irritation, due to the presence of septic substances, he has used arsenic with better results than ten or twenty applications of carbolic acid or creasote. His mode of procedure is this:—He simply clears out the pulp cavity, washes with carbolic acid, and applies arsenic precisely as if for destruction of a pulp, laying the application over the orifice or orifices of the fang cavities, and then filling over with oxycloride of zinc. After an interval of two or three months, if the filling is removed, the pulp and fang cavities will be found dry and perfectly sweet. This method of treating teeth is one which I should not feel inclined to differ from, coming as it does from such an authority; but the fact is I had myself partly done the same thing in two or three cases, before I was aware Mr. Coleman was pursuing that course of treatment. But in the few cases I tried it, it was more from necessity, and because I did not know what else to do. I well remember two cases, both were upper molars, distal cavities with suppurating pulps. The patients, who were going into the country, refused to have them extracted, and wanted them stopped. So after applying the rubber dam and carefully excavating, I placed a large cap of cardboard, on one side of which was a paste of creasote, morphia, and arsenic, over the pulp cavity, filled with osteo, and told the patient that in the event of any pain or swelling to go and have the tooth out. Both cases did well, and one came back a short time ago to have the tooth filled up again, the osteo having worn down. The remains of the filling still covered the pulp cavity, so I simply put in another filling as the patient begged me not to disturb it, it being so comfortable. My experiences are not sufficient to enable me to speak well of this mode of treatment; but when a gentleman like Mr. Coleman brings forward any addition to our knowledge of Dental Surgery, we may be sure he has good reasons for doing so.

Arsenic is also useful for allaying the pain of sensitive dentine in *shallow cavities*. Of the chemical and physiological action of this drug I must refer you to Dr. Arkovey's experiments, which are published in *Transactions of the Medical Congress*, and also in the *Dental Record* for February 1882.

The next drug I shall speak of is CARBOLIC ACID. This is a powerful antiseptic, caust c and escharotic. In Dentistry it is used chiefly in a diluted strength as in antiseptic for dressing the canals of teeth. Strong Carbolic is also useful for allaying the pain of Sensitive Dentine, which it does by coagulating the contents and sealing-up the ends of the dentinal tubes; and by applying it to the gum after extraction it deadens sensibility. When used for capping exposed pulps it should not be stronger then from 1 to 20, as a solution of greater strength acts as an irritant, destroys the layer of odontoblasts, and so probably prevents the normal formation of secondary dentine.

In combination with Glyscerine about 1–12, it may be used to increase the secretion of the palate for the purpose of retaining suction plates, which it does by stimulating the action of the mucous-follicles. Of its value in the treatment of alveolar abscess I cannot speak, preferring another drug I shall mention later on. It is very useful as a lotion, when diluted, for nlcerations of the mouth, and with Glycerine (Scruples ss. to Drachm 1 of Glyscerine, and diluted with about 4 Scr. to 6 Drams of water) is good in cases of sore throat with relaxed uvula and soft palate. In cases after the removal of tartar the edges of the inflamed gums are greatly improved by the application of Carbolic Acid. Should any of you be unfortunate enought when using it to allow any to come into contact with the cheeks or lips of your patient, its injurious effects are greatly counteracted by anointing the parts with olive oil.

CREASOTE is a drug I scarcely use by itself. It is a powerful deodoriser, antiputrescent, and antiseptic, and acts locally as a caustic by coagulating albumen in solution

The chief use I have put it to is in cases of caries of the temporary teeth which are painful, and which require stopping to prevent their too early removal. It is said to have great effect in the tooth-ache of pregnancy.

The late Dr. Dean, of Chicago, said that for alveolar abscesses with fistulous opening on the gum, Creasote soon effects a cure; but in those cases where there is no opening, neither that nor Carbolic Acid should be used, as these drugs coagulate the albuminous ingredients of the pus, and effect its fluidity and thus increase the difficulty of drawing it through the apical foramen; but after the contents of the sac are got rid of, then Creasote may be used with advantage.

EUCALYPTUS.—This drug is one in which I have the greatest faith as an antiseptic. It possesses none of the irritating properties of Carbolic Acid or Creasote, and is not a caustic. It is highly destructive to all low forms of organic growth; and, according to some, is three times as strong as Carbolic Acid in preventing the formation of bacteria. Professor Lister says, "That while entirely free from any toxic or locally irritant effects it is a perfectly trustworthy antiseptic." On the other hand, Dr. Schlemitz, of Arnsberg, says it is not a powerful antiseptic. Mr. Stocken, in his work on *Dental Materia Medica*, says, "apart from its antiseptic properties it is said to be a local anæsthetic, lulling the sensibility of tooth-ache and sensitive dentine." I have used it with great success in all cases of chronic alveolar abscess in the following manner:—I first of all apply the rubber dam, clear away any particles of food or softened dentine, and then bathe the cavity with Eucalyptus. I then proceed to open up the canals using, as far as possible, all antiseptic precautions, for example, bathing the cavity with the oil, using instruments the points of which have been dipped in the oil, and then when I have opened the canals, pumping up more Eucalyptus on a Donaldson's probe. If the tooth is not very tender, and the patient can bear it, I shape the cavity the same day; but, if not, I pump up more Eucalyptus, the antiseptic and antiputrescent qualities of which are greatly increased if used with Iodoform, either in solution, or by carrying it up the canal on some cotton-wool soaked in Eucalyptus, and seal the cavity with Hill's gutta-percha. Again, I prefer gutta-percha to mastiche, as in these cases it not only keeps the cavity much cleaner, but the fluids of the mouth have less power of permeating through the filling, and thus preventing the introduction of any fresh germs. When I next see my patient—say in two days—I again apply the rubber dam, remove the temporary filling, and if the canals are tolerable sweet and there is no sign of pus formation, I shape the cavity, providing I have not done it before, pump up more Eucalyptus, take a small piece of cotton-wool soaked in it and force it up to the end of the canal, so that it shall occupy only a small portion of the end of the canal. I then take some small pieces of Hill's gutta-percha, dipped in the oil, and fill the remaining portion of the canal, and on the top of this put either gutta-percha or one of the osteo fillings, and direct my patient to come and see me at the end of six months to have a permanent filling inserted.

Those cases which I have seen at the end of that time, have all been successful. I ought to mention that in some cases it requires more than the second visit before you can put in the temporary filling; for instance, at times I have noticed when taking out the first dressing you will find a small bead of pus come down. In a case like this a third or even fourth visit will be necessary before the tooth can be stopped.

IODOFORM possesses strong antiseptic powers, and is also slightly anæsthetic and sedative in its action. I have seen it used in this hospital in cases of chronic alveolar abscess, but success with it was not so great as I anticipated unless used with Eucalyptus. This drug has the credit of not possessing any irritating properties, but Dr. Phillips, late lecturer on *Materia Medica* and *Therapeutics*, at Westminister Hospital, to whom I am greatly indebted, in more ways than one, for my knowledge of the inorganic part of the *Materia Medica*, says:—"In certain cases Iodoform is an irritant, viz., when applied to abraded surfaces, especially inflamed ulcers."

The great objection to its use is its odor, but this to a certain extent may be covered with one of the following drugs—Balsam of Peru, Eucalyptus, Otto of Rose, or Tannic Acid; but none of these cover it entirely—Balsam of Peru being the best.

IODINE and ACONITE.— I shall speak of these two drugs chiefly in combination as they are generally so used by dentists.

The following hints I venture to hope will not prove unacceptable:—When applying them to the gum always keep the fluids of the mouth away from the part painted till the Alcohol has sufficiently evaporated, or else the application will be washed away. The part always assumes a metallic lustre when the Alcohol has evaporated.

Be carefel when using it not to have an excess of fluid on the cotton-wool or brush, for fear any of the superfluous fluids should find its way down the throat, as very small doses of Aconite have proved fatal.

In the event of any serious effects happening to you, the following are some of the antidotes—Animal Charcoal, an emetic of Sulphate of Zinc (do not be afraid of giving too much,) Brandy and Ammonia internally; stimulation externally, subcutaneous injection of Atropine.

Should you prescribe Aconite as an external remedy for Neuralgia, warn the patient to keep the eyes closed when using it; or extensive irritation may be set up in the eye.

Do not forget that Fleming's Tincture of Aconite is five or six times as strong as that of the B. P. Iodine by itself is used in cases of Ranula, by swabbing out the cyst after it has been opened and its contents evacuated. For my part, I much prefer to stuff the cavity with lint and so set up inflammation and granulation. In Gingivitis it is good after the removal of Tartar, for touching-up the edges of the gum; but as I pointed out before I use Carbolic Acid instead.

Locally applied it acts as a stimulant, escharotic and absorbent. It is useful in all forms of Periodontitis as it promotes absorption of all abnormal material by stimulating the absorbents to increased action, promoting and hastening healthy action; and as a counter-irritant by directing the circulation to another part.

IRON.—In speaking of this drug I shall confine myself only to its action as a hæmostatic. For the last eight years I have not used anything else but Liquor Ferri Perchloridum to arrest hæmorrhage after tooth extraction, and have never found it fail; consequently, I am in a position to speak of its value.

My mode of procedure is simply this:—As soon as I see the patient I mop out the cavity, clear away all clots, make the patient wash the mouth out well with cold water, and plug with a plain piece of cotton-wool. I then take another piece of wool soaked in the Liquor Ferri Perchlor., remove the first piece, and plug the socket tightly, placing a good pad on the top of this, and tell the patient to keep the teeth together. If necessary I bind up the jaw.

Then just a few precautions to the patient, such as keeping quiet, keeping in an upright position, and taking everything cold.

I use the strong solution of the perchloride in preference to the tincture, as its astringent effects are greater, but it is more acid and often acts as an irritant, consequently in certain cases it may be used with a little water or glycerine.

Its great objection to surgeons using it is that it prevents union by first intention. Iron acts as a true styptic on the blood; it causes a coagulum to form—it narrows both arteries and veins at the place of application, whilst the neighbouring vessels become dilated. Its action varies, however, according to the strength and kind of the preparation used.

ALUM acts as a simple astringent by contracting the arteries and muscular fibres of the part touched by it, and renders the surface pale and dry. If there is not sufficient fluid present to saturate the Alum, it affects the deeper tissues and acts as a caustic. Most astringents favor the action of Alum, but as Tannin decomposes it, they should not be used together, as they may prove less astringent.

It is useful in Simple Stomatitis; but in Ulcerative Stomatitis Chlorate of Potash is a specific. As a hæmostatic I never employ it; but care should be taken not to use too strong, especially in scrofulous patients, as it may cause unhealthy ulceration.

TANNIC ACID is a most powerful external astringent, and there are many before me this evening who use it in preference to any other drug. Applied externally it is preferable to Gallic Acid, but for an internal astringent Gallic Acid should be given, as Tannic Acid becomes converted in the blood into Gallic Acid and grape sugar, and therefor; only part of it is available. For spongy gums it is a useful application, and combined with Creasote it is frequently used in ulceration of the pulp.

MATICO, either in leaf or powder, is an effective styptice but its power is supposed to be due to the mechanical structure of the leaf which, when applied, should have the underside placed next to the bleeding surface.

Chloride of Ammonium, Tincture of Gelsemium and Croton Chloral are used by the Dental Surgeon for the relief of Neuralgia.

I use these drugs as follows:—A patient comes to me suffering from neuralgia, I at once prescribe Ammonii Chloridum gr. XXX, Tr. Limonis Dr. ss. (to cover the nauseous taste of Amm. Chlor.,) Sp. Chloroformi m xv., Aquæ rd Sc. j., every three hours. Should this not give relief in three doses it should be discontinued; and then I give Croton Chloral gr. iij. to X, Sy. Solu, Dr. j., Aquæ ad Sc. j., and I have never found one of these too fail me. Of the Tincture of Gelsemium I have no knowledge beyond what I have read and heard from others; but its value as a sedative in neuralgia is, I believe, very great.

BROMIDE OF POTASSIUM.—This drug is not much used by Dentists, but I mention it to show its great value in convulsions due to teething. Dr. Phillip's in his work on *Materia Medica*, says, "In the restlessness and nerve irritation on convulsions, sometimes attendant on Dentition, bromides are exceedingly useful, so that the gum lancet is scarcely ever needed." In a child, say 12 months old, with convulsions, I give Pot. Brom. gr. iij., Sy. Simp. m X, Aq. Anethi. ad Dr. j., every three or four hours, at the same time I order a small dose of Calomel as a purge, hot baths, and ice to the head.

CHLORATE OF POTASH is another valuable drug to the Dentist in all forms of inflammation of the mouth. In Ulcerative Stomatitis given both internally and as a gargle it acts as a specific, and the same must be said of it in Tonsilitis, particularly when combined with the Tincture of the Perchloride of Iron.

The last drug I shall speak of is the PERMANGANATE OF POTASH. This I conceive to be one of the most valuable medicines in *Dental Materia Medica*, I use it for two things, first for testing whether in a carious tooth the offensive smell comes from a suppurating pulp or from the gum.

It's other great use is when a patient comes with a mouth full of suppurating pulps and polypi. The odor from these is simply unbearable, but with a gargle of Pot. Perman, the Dentist is enabled to bend over his patient with a certain amount of comfort.

In conclusion, I must thank you for the very patient hearing you have given me during a somewhat lengthy paper. I could not go so deeply into the action of some of the drugs as I should have liked, on account of the time, and some I have had to leave out all together: I feel quite sure that lectures on *Dental Materia Medica* and *Therapeutics* at our Dental Schools are greatly needed. Should this ever come to pass the dental student would not only have the opportunity of turning out a better Dentist, but would be able during his student's career to use and judge of those drugs which, under the present system, he seems to have such a very vague idea.—*London Dental Record.*

ARTICLE II

THE HIGHER EDUCATION.

BY J. D. MOODY, DENTIST.

(Read before the Central Illinois Dental Society.)

We hear very much of late about "The High Education." Our dental journals have been full of it; the educational, theological and other professional periodicals literature, teem with it. We see it in our institutions of learning, by the gradual raising of their standard of examinations, both entrance and final. Our civil service agitation is giving a definite value to a knowledge qualification.

The unrest gendered by this struggle after higher intellectual attainment, is noticeable too, in the oft recurring discussions in our dental societies about the merit or demerit of our present standard of our collegiate instruction. At times the war of words wages hot and furious, passion is aroused; estrangement between the faculties of different colleges is brought about; plans for organized effort are frustrated, and individual effort is lost in the great sea of contention, and stands for naught. The reformers, who are always in advance of and who yet give shape to public sentiment, become disheartened, and the more timid ones prophesy failure. But notwithstanding these discouragements, we are advancing; the outpost of public opinion are, one by one, assailed; gained and held; and thus a progress is made which, though slight, is yet of a permanent character.

In this battle among the giants, where do we, as a profession, stand?

Whatever differences may exist between individual leaders, or what ever the clasping of dissonant views may do to retard, for the time being this tide of advancement, the fact nevertheless exists that the foremost men of our ranks demand, from the profession at large, that they adapt themselves to this higher educational standard.

By the world at large, we have not been accorded the scientific and intellectual position after which we have been striving; and perhaps for this reason, this state of unrest which promises future progress, is more apparent in our profession than in any other. From the gradual advance that is being made we have reason to hope that, sometimes in the future, ours will truly be one of the learned professions; and learned not in the sense that it *professes* a high standard, but in the fact that the rank and file *possess* this high standard.

Did I say we seem to be progressing towards this end? While I believe this to be a fact, and while we are told to possess our souls in patience, there is yet a dark side to the picture, which we cannot, without danger to our hoped for success, fail to look squarely in the face. And it is this that, while my foregoing statements are true of the front rank, the great masses of our profession have neither these attainments themselves, nor do they seem to care for them. This being the case reformers have a Herculean task before them.

Is this indifference real or seeming? Let us see first how it is with the educated portion of our ranks: A large per centage of the students in every graduating class, while being faithful, attentive and successful students, yet pursue their studies no farther than will warrant their obtaining their diplomas. Their every effort seems to be turned in this one direction of passing examinations and getting away. Work given to them, which while of value to them in after life, and counting nothing in examinations, is shirked. The advice of their superiors in these matters, is held in light esteem. They seem to be wholly absorbed with the ideas of getting away from study and to go to money-making. If in after life the study was resumed, it would, in a measure, atone for these short comings of student life But how few of them seriously pursue afterwards, either their dental studies or any line of investigation. Of course there are some who do go beyond the course actually required for the sake of the good it will do them in the future, but I believe these to be largely in the minority.

It may be objected, on the part of some, that in the time allotted to the course, only the attainments necessary for passing examinations can possibly be acquired. If this is so, justice to themselves, as well as to the profession they are about to enter, would require the student to go to college with a preparation which would enable him to make the most of the advantages offered. The same holds good with the medical and legal professions. We claim to be a learned profession; and yet our average dental student begins the study of his profession at the same mental point at which the ordinary college student begins but the preparation for the study of some profession. We have neither a preparatory course nor any assurance, hardly even a presumption, that our students will ever be learned men. Is this the fault of our colleges? I trow not. That they are trying to change the present condition of things, and compel a more highly educated class of applicants, is evidenced by the gradual raising of the standard of their entrance examinations. This trouble, of which I have been complaining, does not lie at the doors of our dental colleges. We find in it the seeming indifference, in the great mass of our profession, to the necessity of a higher grade of intellectual culture on the part of the dental student. The average applicant for a place as a dental student would not think of applying for a position with a Garretson, a Kingley, or a Boerdecker. The very consciousnsss of their ignorance would be too glaring to allow them to do it. Gentlemen, of course you recognize the converse of this proposition. The trouble lies within ourselves. Have I stated the case too strongly? The real fact is, that such a large number of the dentists, especially in the country districts, are such utter ignoramuses, as to give a corresponding tone and coloring to the dental profession at large. The little heaven from the colleges will be a long time in leaving the whole lump. I use the word "ignoramus," only in a professional and scientific sense. To so great an extent, that. in the eyes of the general public, we are professionally and scientifically of one caliber. There is but little discrimination on this point. Of course the dentist having real ability will, in time, have it recognized in his own circle; but the stranger coming to him eyes him askance, knowing full well that the mere title, "dentist," or "doctor," conveys with it no warrant of fitness. Indeed the public have been for so long a time educated in an opposite direction, that they are unfit even to place the proper estimate upon a man's value. Directly the opposite should be the case.

What then, in fact, are our professional attainments? While every part of our work has to do with the laws of physics, how many of us have the slightest conception of the molecular changes going on beneath our touch? How many of us seem to care? It has been years since we have known of the terrible dangers attending the growth and presence of micro-organisms, and yet how many dentists are there who can intelligently discuss a paper on that subject? While our success or failure depends, to so large an extent, upon knowing how to combat with microscopic things, how few of us use that instrument as one of our most valuable aids! While having to do with questions of life and death, we hardly know the first principles of biology. The chemical relations with which we have to do, confront us at every step, yet how many of us understand a chemical formula? While having to do with morbid pathology every day of our lives, how few of us can enter intelligently upon a rational explanation of these morbific growths, and consequently a rational treatment of the same.

A lecturer before a scientific body presents for our edification an excrescence growing out from a lizard's tail, and triumphantly claims it as a mistake of Nature, and we tender him a note of thanks to cover our inability to gainsay this travesty upon scientific teaching. We handle foils, alloys, plate, and tools, and yet the scientific of metallurgy is almost beyond our ken. We are dabbling in electricity, and yet how few of us can read with understanding a journal of electrical science? Now these thoughts force themselves upon our attention again and again. What are we going to do about it?

Gentlemen, I have presented this matter in this strong light to first arrest your attention, and secondly to bring your individual responsibility plainly before you. Having done so, may I point out two or three means by which we can and should, to our individual extent, correct in a measure this condition of things?

First, being in the profession throws upon you the obligation to do everything in your power to further its interests. You cannot be an intelligent man nor dentist, without extensive reading. It should be that to be known as a "dentist" would imply public recognition as a learned man. We should be looked up to in every community as authority in scientific matters. It properly belongs to us. Our profession should be a passport into every society. To accept anything short of this, is to lower our position from a profession to a mere trade. *The Scientific American*, *Science*, *Popular Science Monthly*, and kindred journals, should be part of our working force. But in our own line, how meagre is the array of dental works usually found in a dentist's office. You will generally find the dental bible and hymn book, (that's "Harris" and the "*Cosmos*.") and a chart of the 5th pair of nerves. Even of those who keep up with the current literature, but very few have a dental library worthy the name. The list of dental books is not a very large one. Let us begin by buying one—the one we most need perhaps—read it through carefully, not make a study of it, but carefully enought to know what you will and what you will not find in it. Then get another, do the same with it, master the contents if not the subject matter, and keep on doing so until you have persued every strictly dental work within reach. Include in the list an elementary work on Physiology, Histology, one on Morbid Anatomy, and one on the general practice of medicine. Having done so, and this is within the reach of all, you will be a mucn better dentist, and a much better citizen. Having gained a knowledge of the contents of your books, they will be referred to again and again, and will contribute much to your ultimate success, I know the dollars come hard, but they come harder when you begin to drop behind. I would urge this plan upon you all. It will place you upon a higher plane of intellectual life. It will compel respect. Now for another practical suggestion: I believe every professional man should have some hobby outside of the strict line of his work. It should be something upon which he could expend all his spare energy of body and mind, and something to which he could go for recreation. It should follow the bent of his mind, be either mechanical or chemical, in botany, zoology, entemolology, geology, electricity, or, in fact, anything, only so it will act as a support to the mental powers. Mere physical exercise, such as hunting, gymnastics; etc., is good in its place, but will not accomplish the good which the others will.

Our professional life throws a great strain upon the brain. Natural sleep is all the absolute rest that it needs. A change of brain effort, from bread winning to pastime, brings to light a marvellous provision of nature, to prevent either a stagnation or a total break down. Nature studies are the best. Wearied and perplexed with the cares of a day in the office, well nigh broken down, both in body and in mind, go out for an hour's butterfly hunt, or to look for some rare plant in which you believe to be hiding near by, and see how quickly all is changed. The tired muscles are forgotten—in fact are tired no longer—and refreshing sleep follows with its healing virtues. But to receive the most good from this by-play, no thought of gain must enter into it. It must not be made to contribute the value of one cent to your table, nor to your purse. It must be purely a recreation. Neither should this pastime be changed from time to time. All through life, the one hobby should be followed until you are a master in it. By doing this, at the end of your life you will have achieved great good to yourself, and will have been able to contribute much to the sum total of human knowledge. Some of the best work ever done in special lines of research, has been accomplished in after office hours by men active in professional life. We have no right to be selfish. We owe something to society. The man who recognizes this obligation is in better condition, physically and socially in the end, than he does not. Now if these plans were brought to the attention of every one they might be accepted and acted upon with energy by a few, and in a half hearted manner by many more, but only to be dropped after a short trial from want of a stimulus to continued effort; or they might be carried on for a very long time by some, but in a sort of aimless manner that would defeat the very object to be gained by it.

The average man would not pursue, to as successful a conclusion, and study or work that had for its aim simply recreation or the general advancement of knowledge, as if something to act as a stimulus were held up before him.

In what manner shall we best provide this needed stimulus? May I offer a suggestion? Create a new dental degree, to be bestowed only upon such as have pursued a prescribed post-graduate course and passed satisfactory examinations in it. The examinations to be taken in one year or in twenty only insisting that they be taken. The post-graduate course to be, scientifically, a very broad one; perhaps insisting that it must bear, directly or indirectly, upon some phase of dental science. Also that the examination for this degree be preceded by one to show that the applicant is a more than ordinarily well informed person, or to have pursued some scientific study, *as* a study, or a pas time, and to have attained a degree of eminence in it, thus proving his right to belong to a learned profession. I would, in this way, create a sort of dental French academy, a dental academy of sciences, something which it would be an honor to belong to, something really worth striving for.

I use the word post-graduate simply for convenience and in a general sense, not confining it to those who have graduated, but applying it to a course of study outside of and beyond the ordinary collegiate course. The standard of this degree might be secured by law, through the inner-State Board of Examiners, or by inter-collegiate action. I am well aware that the creating of any new degree has been deprecated by many of our best men, and not without good reason. But let me for a moment examine the claims for my proposition. The safety of our profession and of the public alike, requires the dentist to have proper credentials before engaging in practice, showing that he has pursued a proper preparatory study. The easiest and best way to designate that is with the D. D. S. But, practically, that is *all* it means. The M. D. for us means no more, only that we can consult with a physician. Neither of these conveys any warrant that its possessor is a learned man, nor that he ever will be. Indeed, we know that the majority of both dental and medical graduates are but of mediocre calibre, and achieve but mediocre success. Of course, in any event, all men would not stand first. There always will be grades of intellect. But the ordinary man *can* occupy a much higher position than he now does. The great reason of so much mediocre talent is, that the stimulus which produced a successful examination was suddenly withdrawn, and the mind, clogged with care, was not able, unaided, to keep pace with its fellows in the intellectual race. Now place before the student, just as he has successfully passed his preparatory examination, another which even the brightest intellect must be years in attaining, but which we may all hopefully strive after, and you, at once, put a premium upon intellectual effort which will have a value for all time. It will be something worth working for; something which will unerringly testify that its possessor is a learned man.

A large proportion of the dentists in the country are in no sense learned men, and under present circumstances never will be. They came into the profession from various motives. Some came in by the college door, and many clîmed over in other ways. They all came in with hopes for the future, but with the majority, all energy and will-power have been crushed by disappointed hopes, and al projects of future college study blasted by want of funds. Time and money, both are wanting. Usually expenses cannot be thought of. The tread-mill of routine duty saps all vitality. No race-course has been marked out, no prize is within grasp. Stimulus of enthusiastic competitors is wanting; the mind becomes weary; the energies lag, and life becomes an aimless existence.

This is no fancy picture. It can be verified in a thousand instances. It may be objected, however, that the present race of unlearned dentists will, by virtue of our laws, die out in another generation, and thus a cure be affected of itself. While the condition of things would be bettered, it would be but in a slight degree, for I have shown the average graduate on entering upon his work, drops all but finger education and in no sense is a learned man. So it always will be. It is only by the untiring efforts of the few, who, endowed by nature with qualities of leadership, can by force of example or precept raise the standard of our profession, and, in a measure, keep the masses up to that standard. But in some such lives as I have indicated, the profession at large can be encouraged to work to a higher plane, and by diligence and perseverance win for themselves a place in the scientific world. We cannot afford to be left behind. Other professions are advancing, even the non-professional ranks are advancing. We, too, must advance or drop our pretensions.

The notes for this paper were prepared during the summer for this meeting. But since that time I found that in all probability the personel of the meeting would be different from what I had anticipated.

I have great sympathy for the country dentist, for I am one myself. Very largely he is the victim of unfortunate circumstances. A great many of them would be glad to go higher if they could. One great purpose of our society, in the first place, was to reach out after these, help them to better their condition, bring them into harmony with the spirit of progress, bring them into the State society and make them better men socially and professionally. They do not come into contact with the progressive ones. They have lost all vim, even care not to better themselves, thinking it beyond their grasp. And yet this very class give tone to our profession in the mind of the general public; and it was their friends who well-nigh defeated our present excellent law. I have come in contact with these a great deal, and I believe they can be reached. To such I offer the suggestions in this paper about personal effort. To others I offer the suggestion a new degree. It may bring a smile of ridicule, but I believe that within it there lies a germ capable of producing much of good to our profession. If there has been a practical paper in any of our journals on a course of reading, such as I have indicated, I have not seen it. I believe it is needed.

Gentlemen, let us catch hold ot our boot-straps and see if we cannot solve the problem.—*Ohio Journal of Dental Science.*

ARTICLE III.

IRREGULARITY.—A PRACTICAL CASE.

BY CHAS. P. WEINRICH, D. D. S.

Miss S. L. came to me for consultation. On examination I found some very irregularty and badly decayed teeth. The irregularity was entirely confined to the teeth of the superior maxilla. She seemed very much embarrassed by her appearance and the impediment in her power of speech, and inability to control the action of her lips. A badly decayed and pulpless central and lateral superior incisor added to the unsightly appearance. The masticating surface was small and imperfect. Being quite handsome and seemingly anxious about her appearance, etc., I felt certain that she would appreciate the results I aimed to accomplish. She was twenty years of age; the teeth large and very well formed. The case looked very unfavorable, indeed. The cuspids were exceedingly prominent. They rested upon the distal half of the labial surface of the lateral incisors. Their position was the main cause of the unnatural and noisome appearance of her mouth. When she laughed her lips would be drawn above the cuspid; the replacement of which required attention. While in repose the corners of her mouth were very prominent. She was very much elated when I assured her that this could be remedied. The prominence of the cuspid on the right allowed the first bicuspid to come within the thickness of thin blotting paper of touching the lateral incisor. The second bicuspid of this side was in its relatively proper position. The first molar was decayed below the margin of the alveolus; the second was badly decayed and the pulp diseased. On the left the cuspid was as prominent as the one on the right. The bicuspids did not antagonize with their fellows of the inferior owing to their inward inclination. They occluded inside and anteriorly to the bicuspids of the lower jaw. The first bicuspid was within one quarter the antero-posterior diameter of the cuspid of touching the lateral incisor, and the second in its relatively proper position. The first molar must have been extracted rather early, for the second had nearly attained the first molar's place in the arch. The palate between the bicuspids was quite high, and the rugue were prominent and had a crowded appearance. The teeth of the inferior maxilla were not regularly arranged; there being a slight crowding of the incisors and turning of bicuspids. This I perceived would do no particular harm, but on the contrary be gradually remedied by the pressure of the tongue and lip after relieving the pressure upon them by the superior incisors, owing to the crowding of cuspids, etc. The incisors and molars were the only teeth antagonized with their fellows of the inferior arch.

The patient came to me with the intention of having several teeth extracted; thinking that thereby to make room for the cuspids to attain their proper position in the arch; and having an artificial substitute made. But she finally consented to allow me to do what I thought best for the case.

After extracting the diseased roots of first molar on the right, I could, by judicious treatment, save the pulpless incisors and set in pieces of artificial teeth; for the central was minus its distal half of crown; and the lateral its mesial half. There was a slight discharge from these teeth of fetid matter. Her face had been swollen several months previous in consequence of an abscess.

She was very much gratified by the idea that I intended to do so much. She had been to several dentists quite recently who would have operated to her loss. One dentist wished to extract the cuspids, but she would not submit to the loss of a "front tooth." Another advised her to leave the unsightly cuspids as they were. He thought it not best to interfere with them.

Upon inquiry I learned that her parents, several years ago, had taken her to a dentist to have her teeth regulated. The dentist had extracted several of the deciduous set, and dismissed the patient with the idea that everything would go well now.

The patient stated that he gave them no instructions, but told them that the teeth would attain their proper position in the arch.

Still we grumble about the negligence of parents, and talk of educating the people.

When the irregularity is neither great nor complicated they will assume their proper position if the cause is removed between the tenth and ninteenth year. But the patient should be instructed to have them attended to during that period.

I found by measurement that by pushing the bicuspids of the left out and back they would antagonize properly, and there would be space enough to permit the cuspid to be drawn down into its proper place in the arch. By extracting the roots af the molar on the right and the bicuspids brought to their proper position, the cuspid would be permitted to assume its proper place.

I found that it was about as difficult to accomplish my desire, as it was to devise a means of regulating these teeth.

March 29th, 1883.—Took the impression. A few days after inserted a plate covering the hard palate and buccal teeth with the exception of those to be moved. Applied a jackscrew to each bicuspid on the left. She possessed the extent of masticating surface she previously had. It was necessary to separate the jaws somewhat to allow the bicuspids to be pressed out.

Although I met with several difficulties I did not expect, the teeth were moved, but not quite far enought back towards the molar.

During the use of this plate it was gouged out so as to permit the wedging of the bicuspids on the right; which, with the use of rubber wedges, were moved back somewhat. Wedges cut from block rubber are very effective. I did not know of its having been used for that purpose until a few months after I had employed it.

May 11th, 1883.—Removed this plate and substituted one covering the hard palate and extending around the tuberosity of maxilla. Four pieces of steel wire were bent to closely lay on the plate and pass between the bicuspids and bicuspid and cuspid, one each side. These springs were to push the bicuspids back, using hard plate, tuberiosities, and molars as fulcrum.

This apparatus was not a success. It moved the molars about as much as it did the pre-molars. If permitted to remain in the mouth it would have caused a great deal of mischief. The cuspids would not have sufficient space if the molars were brought forward. I found myself in quite a dilemma. I could not very safely make use of a fulcum. The teeth and palate did yield and would do so again. This yielding showed the practicability of Coffin's method of regulating. The molars had undoubtedly small roots and were not firmly attached. Therefore the impracticability of Farrar's method, as much as I know of it, in this case. There was no need of spreading the arch by a "Coffin plate," for there was sufficient room. I gave the applicability of Farrar's method to this case considerable though, and came to the conclusion that it could not be used. For the teeth that are generally firm and used as fulcums moved readily.

I next resorted to rubber bands and wedges. Stretched a band from molar to bicuspid thinking that perhaps the latter would move first and knowing that the molar would assume its original position if pressure or obstruction be removed. And a membrane having been irritated' will absorb surroundings more readily than one not having been irritated. Having these facts in view, I took advantage of the cuspid and lateral, alternately, from which to wedge the bicuspids back, and succeeded.

June 21st, 1883.—Then made a plate covering the hard palate and tuberosities. This was the most effective apparatus I had used. Rubber bands were stretched from a hook on each side opposite the second bicuspids and stretched over the cuspids. This appliance began the same mischief the other one did, but fortunately, the cuspid were opposite their proper position,

July 16th, 1883.—Removed plate. Used ligatures and rubber bands and drew the cuspids into the arch. The lateral incisors, owing to the cuspids resting upon them, were pressed inwards, but they were brought out by the use of ligatures and bands, which were applied promiscuously to the buccal teeth as a fulcrum.

The ligatures and plate did not hinder the power of speech much.

The patient could not masticate with comfort. A privilege she had not enjoyed for some time.

August, 1883.—Thus the irregularity was removed. The bicuspids were retained in their new position by occlusion with the inferior corresponding teeth. The lateral and cuspids were retained by applying a clasp to a bicuspid and extending a piece of plate gold to labial surface of the cuspid and one to palatine surface of the incisors.

To replace the missing part of the lateral and central incisors on the right, after treatment, set in pieces, ground from artificial teeth, with "Weston's Insoluble Cement." To test the teeth and the fear of to great a contrast between the gold and the dead tooth structure, I thought it the best material.

Thus, I did all I could for the patient. The operation gratified me very much. Her parents and friends were very much pleased with her appearance and the success of the treatment. The change in her appearance was indeed very marked. Friends that had not seen her for some time spoke of the change in her countenance and could not think of the cause. Her mouth was perfectly healthy. She enjoyed a better masticating surface.

January, 1884.—I saw the patient. Her health was very good.—*Dental Register*,

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ARTICLE IV.

SURGICAL DELUSIONS.

BY JOHN B. ROBERTS, M. D.

Many surgical theories and procedures have become traditional, and are accepted as true and correct, merely because reverence for antiquity, or careless acceptance, has not questioned their right to be classed as surgical facts. The present age is an incredulous one, and demands accurate investigation of all such claims. The field of investigation is large, for progress has been retarded by the influence of theorizing writers, with monochromatic vision the example of non-seeing and non-looking devotees of the fetiches of surgical superstition and the convincing effect of a repetition of false statements. I shall select a few topics which have greatly interested me and concerning which I probably differ quite widely from many of you.

CHLOROFORM ANÆSTHESIA.

Many still cling to the delusion that chloroform is a safe anæsthetic, because they have never seen a patient die from it. Is one man's experience to weight against the physiological, the experimental, the clinical experience of the whole world? Dare we employ chloroform, instead of ether, when recognized authorities state that in chloroform anæsthesia death occurs without warning in the hands of experienced administrators; when Schiff and Dalton reject it in physiological laboratories, because of its mortality; when the scientific grants committee of the British Medical Association assert that chloroform is a more dangerous anæsthetic than ether.

Adherence to chloroform in the face of such facts is criminal when circumstances permit ether to be obtained. The assertion that it is often impossible to produce anæsthesia with ether is the result of inefficient methods of administration. Ether if given as chloroform is and should be given, is, in truth, a useless anæsthetic, but given properly it is efficient.

VALUE OF STYPTICS.

The belief in the necessity of styptics is a delusion less dangerous than that first mentioned, but is given more extended credence. Such agents are seldom, probably never, needed in general surgery to arrest hemorrhage. When ligatures, torsion or acupressure is not demanded, and such is seldom the case unless the artery is as large as the facial, moderate, direct pressure, applied in dressing the wound, is the only hemostatic required. Styptics often do harm, and, as they are not needed, they should be discarded.

FATALITY OF SMALL HEMORRHAGES.

There is much misapprehension about the quantity of blood that a healthy person may lose with impunity. Many who often look with equanimity upon a parturient woman losing a pint of blood from the uterine sinuses would be dismayed at a woman losing half or a quarter that amount during removal of a tumor. While not advocating needless waste of blood, and especially in patients suffering surgical shock, I assert that there is an unnecessary fear of blood spurting from a few insignificant vessels. The largest artery can be controlled by pressure not greater than is used for ringing the electric bell in your hotel. Hence there is always sufficient power in your fingers to obviate fatal hemorrhage until strings can be obtained and applied.

DANGER OF TREPHINING THE SKULL.

The dislike to make exploratory incisions in closed fractures of the skull evinced by some surgeons and the objection of others to trephining, and thus opening the diploic structure in open fractures, are delusions of a most disastrous tendency. To wait until symptoms of cerebral compression or inflammation have supervened is to lose the most favorable opportunity for mechanical relief. Such a Fabian policy is often followed by death. The treatment of open and of closed fractures of the skull should not be looked upon as very different, since, with the present improved methods of dressing wounds, the successful issue depends almost entirely upon the cerebral rather than the cranial phrase of the injury. If such fractures as are usually seen in the skull were not in proximity to the brain, the surgeon would consider them almost trivial. The feature of closed fractures that renders them so troublesome is the obscurity that accompanies them. I have for a number of years strongly advocated making closed fractures open ones by means of an exploratory incision, whenever there is a suspicion of the existence of depression or splintering. In open fractures operation to elevate depressed portions and get rid of splinters of the inner table thrust into the membranes should be undertaken rather than avoided. It is better to err on the side of action than that of inaction. Careful manipulation and proper dressings at an early stage are sources of less risk than is incurred by the surgeon who leaves unseen and unsuspected fragments thrust into the membranes or brain.

OPERATIVE DELAY IN STRANGULATED HERNIA.

A delusion of fatal issue is that leading to postponement of operative interference in strangulated hernia. Repeated attempts at forcible taxis and medical pow-wow-ing with temporizing measures have ended more lives than the use of the knife. Herniotomy done within twelve hours is almost always followed by recovery. Death is to be expected, however, if strangulation has existed for two or three days, and the gut has been bruised by violent manipulation in the endeavor to relieve the contraction by taxis. Moderate taxis under ether, a half day's treatment with cold applications and the internal use of morphia, and a second moderate attempt at taxis, followed, if unsuccessful, by immediate operation, is the sequence to be followed in strangulated hernia. When symptoms of strangulated hernia exist, the slightest fullness and tenderness in one groin over either of the rings is a sufficient localizing indication to warrant operation.

OPERATIVE DELAY IN ACUTE PHLEGMONOUS INFLAMMATION.

No insane delusion no Spanish inquisitor ever caused so many hours of excruciating physical torture as the hallucination that acute abscesses and furuncles must not be incised until pointing has occurred. All the world knows that evacuation of imprisoned pus in phlegmonous inflammations means instant relief of the agonizing pain; yet how few of the profession early and freely incise such inflamed tissues unless they first see the yellow pus under the thinned skin or feel the fluctuation of the fluid in the abscess cavity. The pain is caused by the effort of the pus and sloughing tissue to escape. Is it not, then, more rational to make a free incision to-day than to wait till next week? Time and pain are both saved by early incision. If the cut is made before the pus has actually formed, so much the better.

Probably no form of abscess needs early and free incision more imperatively than that under the palmar fascia. Destructive burrowing of pus is prevented by this radical procedure, which also saves the patient many days of poultices and purgatory.

OPERATIVE DELAY IN MALIGNANT TUMORS.

Much bad surgery results from a delusive postponement of operative interference in malignant diseases. Instant removal is to be practiced in such cases provided the patient is deemed fit to stand the surgical shock.

NECESSARY FATALITY OF TRAUMATIC TETANUS.

That traumatic tetanus is of necessity fatal is a commonly held opinion. Proper treatment is sometimes neglected because of this belief in its hopelessness. That the prognosis is extremely unfavorable, I admit, but that cases of a severe type recover is undoubted. Chloral hydrate in full doses has given the best results ; but I do not propose speaking of therapeutics at this time. I merely wish to impress upon the profession the fact that a fair number of cases of traumatic tetanus have recovered.

FATALITY OF PERICARDIAL AND CARDIAC WOUNDS.

The prevalent notion of the excessive danger of these wounds is delusional, at least in as far as it teaches that these structures will not brook surgical interference. The pericardial sac should be dealt with exactly as the pleural sac, by aspiration, incision, irrigation and drainage according to the lesion. That simple puncture or aspiration of the heart itself is not accompanied by the expected risk to life has been pretty well shown, though I am not prepared to recommend its general adoption for trival cardiac conditions.

SYMMETRY OF NORMAL LIMBS.

Another delusion still existing in many minds is that the extremities are usually of the same length. Clinical and anatomical investigation show that asymmetry in the length of normal limbs is of common occurrence. Therefore, measurements of the legs in cases of fracture are of little value, since it is impossible to know whether it is the femur of a long or a short leg that is the seat of injury.

USEFULNESS OF TREATING VICIOUS UNION OF FRACTURES.

It is a fact, not sufficiently appreciated, that many cases of deformity, from imperfectly treated fractures of long bones, can be remedied by refracture. Over and over again have I seen cases of grave disability and deformity cured by the application of sufficient force to break the callus uniting the misplaced fragments. Five to six months is not too late to resort to this expedient for correcting what, otherwise, must be a life-long evidence of defective surgical attendance.

There are many other prevalent surgical delusions, such as, that bony union of transverse fractures of the patella and of intracapsular fractures of the femoral neck cannot take place; that chronic purulent discharges from the ear do not need active treatment; that hypermetropia and hypermetropic astigmatism can be properly estimated and corrected, without palalyzing the accommodation; that it is improper to perforate the nasal septum in cases of great deviation; that crooked noses are not amenable to treatment; that corneal operations and cataract extractions should be treated by cotton padding and bandages to the eyes; that fractures should be treated with carved or manufactured splints.

While an earnest advocate of conservative and of reparative surgery, I believe that when operative surgery is demanded it should be aggressive. Delay, indecision and insufficiency impair the value of much surgical work, and are often the legitimate result of a superstitious faith in delusive surgical dogmas.—*Buffalo Medical and Surgical Journal.*

ARTICLE V.

OBSERVATIONS ON NEURALGIA OF DENTAL ORIGIN; ITS DISCRIMINATION AND OPERATIVE TREATMENT.

BY J. MORLEY DENNIS,

(Dental Surgeon to the Grimsby and District Hospital.)

Of all the secondary affections connected with the teeth none is more troublesome than Neuralgia. It may be described as a disease of the nervous system manifesting itself by pains, which, in most cases, are unilateral, and which appear to follow accurately the course of particular nerves, and ramify, sometimes into a few, and sometimes into all of their terminal branches. It occurs in paroxysms, perhaps at nearly equidistant intervals, the pains being usually sudden in their onset, and of a stabbing, boring or burning character. The attack increases in severity on each successive occasion, while between the paroxysms the patient is usually free from pain, and the attack often ceases as suddenly as it comes on. It has been said that from a pathological point of view the disease Neuralgia probably has no existence; it is but a symptom indicative of a lesion at some points, which may be discoverable, or may be hidden from our view; and it is not indicative of any one particular lesion, but of a great variety of morbid conditions. It often consists of pain, and of nothing else that we can perceive, and in many cases is attended by no inflammation, no detectable change of structure, and no fever. That pain is owing to some morbid condition, or to some irritation of a particular nerve, we may sometimes know by finding that it is felt exactly in the course, and following the distribution of that particular nerve; but in the absence of any such symptoms we have some difficulty in forming a correct diagnosis; and again the difficulty is increased when we consider that it may be produced by some source of irritation operating at a distance from the part in which the pain is felt. It may be in the brain itself, or in the spinal cord; in the trunk of the nerve that supplies the effected part, or in one of the remote branches of the same trunk, so that it is necessary when we can find no explanation of a pain in the place in which it is felt to look for some condition that may explain it in the trunk of the nerve supplying that part, or in the parts supplied by other branches of the same nerve. These remarks refer more particularly to Neuralgia of the trifacial nerve, which from the similarity of of its symptoms to those of other diseases affecting the teeth —the dental pulp, and the alveolar periosteum—is liable to to be mistaken for one or other of them, as also Neuralgia of dental origin is often mistaken for Neuralgia arising from other causes. It is, therefore, not only necessary that we should make ourselves acquainted with the symptoms of each, in order that in case it arises from irritation or any other morbid condition of the teeth or alveolus, we may, if possible, remove that irritation, and, on the other hand, if it arises from other causes, we may at once refer it to the general surgeon for treatment, but that we should also be able to define the locality of that irritation.

In making an examination of patients, with a view to the discovery of the pain from which they are suffering—and I cannot but consider this description of neuralgia rather as a symptom than as a disease *per se*, because, from whatever cause it arises, it is the effect of some condition existing sometimes at a considerable distance—we must not, however, place much reliance on the statements of patients, without at the same time giving due consideration to the possibility of the pain being reflected, and thus misleading us as to its origin. Many cases have been related in which the patient has ascribed pain to be due to some particular tooth, and which, on fuller investigation, proved to be caused by irritation from another tooth existing in a different part of the mouth, and in some cases the antagonistic tooth of the opposite jaw. Mr. Tomes relates a case in which this perverted sensation was so definite that it was with some difficulty he persuaded the patient that the source of his trouble was not where he felt the pain.

A gentlemen requested him to extract a perfectly sound second *upper* molar, the tooth affected being the corresponding *lower* molar of which the pulp was exposed. The *lower* tooth was extracted under nitrous oxide, but so soon as he recovered he exclaimed, "You have taken out the *upper* tooth after all;" nor could he be persuaded, until he felt the vacant space with his fingers, that such was not the case.

Mr. Stewart some time ago brought before the notice of the profession another subject which it will repay us to consider at the present time; he points out clearly the misleading effects of attention in cases of facial neuralgia from dental irritation, which, he says, "Must be continually kept in view in the practice of Dental Surgery, otherwise disappointment in the results of operations would be frequent. In a large proportion of cases of Neuralgia dependent on dental irritation the patient has a foregone conclusion that a tooth which he indicates is the source of the pain—a conclusion so firmly held that he has resolved on the extraction of the tooth, and is astonished and incredulous when told, after examination, that not it, but another, is really the seat of the pain. It is often difficult, and sometimes impossible, to compel belief that a tooth he had no reason to suspect, probably in the opposing jaw and several teeth distant, is the cause of all he has suffered, and should be extracted rather than the one he was prepared to lose. As cavities that produce acute dental irritation are generally recent, sometimes cause no pain in the tooth, and are often such as cannot possible be seen or felt by the patient, he is obliged to search for source of pain, and any tooth on the same side with the pain, that presents some altered appearance, is fixed on, and immediately, somehow or other, has pain transmitted to it. A dark stain merely, a chip—probably an old one—a root, however small, and especially a cavity plainly seen or felt, suffices to direct attention and pain to a particular tooth, although the stained part be sound, the chipped surface harmless, the root incapable of mischief, and the cavity dormant." It will be observed, therefore, how easily we may be mistaken in our diagnosis, unless we make a careful examination of the entire mouth with a determined intention to come at the true cause of the mischief, rather than lose the confidence of our patient by sacrificing a useful tooth without affording him any relief, for the sake of avoiding a little trouble. One difficulty we have to meet is that patients will not always act upon the advice given; in this case, however, they must take the consequences.

Neuralgia may arise from chronic inflammation of the dental pulp, difficult eruption of wisdom teeth, secondary dentine in the pulp cavity; decomposition of a dead pulp in a confined space; exostosis; alveolar periostitis, which may depend on the escape of decomposition matter through the pulp canal, or on roughening of the fang by absorption, exposure of sensitive dentine, etc., the most common cause being chronic inflammation of the pulp. Neuralgia may attack any of the three divisions of the fifth nerve, but rarely more than one at a time, and generally either the second or third. M Trosseau attaches great importance to the diagnosis value of the tenderness sometimes felt over the first two cervical vetebræ; in this, however, Dr. Anstie and Mr. Tomes do not entirely agree. The intermittent character of the pain is regarded by some as of great value in the recognition of the disease. If the pain is most acute about the temple, the irritating tooth is generally situated far back in the upper jaw; when it is referred to the condyles the offending organ is generally in the back part of the lower jaw. These rules will aid us when it is caused by the difficult eruption of wisdom teeth, which should be cut down upon and removed, and if impaction is suspected the second molar may be extracted. When the pain is due to exostosis, absorption of the fang or secondary dentine extraction is necessary. In chronic inflammation of the pulp, if possible, treat the pulp antiseptically, cap and fill; if not, it must be destroyed and removed. In cases arising from decomposition of dead pulp, open out cavity, clear away decomposed matter, and disinfect. When alveolar periostitis exists try leeches, iodine, aconite, etc.—*London Dental Record.*

ARTICLE VI.

HOW TO SECURE GOOD DENTAL ORGANS, PREVENT THEIR DECAY, PREVENT RICKETS, HIP DISEASES, ETC.

BY H. E. DENNETT, D. D. S., BOSTON, MASS.

In the discharge of their duties, the physician and dentist are daily asked by their patients, "What must I do to prevent my teeth from decaying!" The answer should be, "Correct your diet." That is, eat such food, and only such as contains all of its natural elements. If we eat the products of grain, we must eat them with all their elements as furnished by Nature. If we eat meat we must also eat bones or our systems will suffer from a violation of one of Nature's unerring laws. It is conceded that dental decay is the dissolving away of the lime salts by the vitiated secretions. This is not due so much to a want of cleanliness of the mouth as is commonly supposed; for it is not true that "a clean tooth never decays!" One may devote twelve hours out of the twenty-four to the ablution of the mouth, and fail to prevent decay of the teeth so long as Nature's dietetic laws are violated. Dental development in man is discernable as early as the seventh week of intra-uterine life; hence the importance of a strictly correct diet from the start, if mothers wish to give birth to children who may have perfectly formed teeth; and perfect health includes a perfect set of teeth, for they are little indicators, denoting by *their* condition that of the whole system, just as a thermometer indicates thermal changes. A mother who passes through the period of gestation and lactation without a sufficient supply of tooth and bone material in her food will suffer from loss of teeth, neuralgia, rheumatism, and other diseases that result from an impoverished state of the system. The lime from her teeth will be dissolved, taken into the circulation, and appropriated by the offspring. Excepting *civilized* man, all flesh eating animals eat as much of the bone with the flesh they devour as they can break with their teeth sufficiently fine to swallow. Place before a tribe of Indians everything the earth produces in the shape food, and they will eat only animal food so long as that lasts; but put them upon a resservation, and feed them as civilized people feed themselves, and decay of the teeth soon follows. Take from any carnivorous animal its supply of bone which Nature furnishes with the flesh, and decay of the teeth is sure to follow. Several years ago, the lions in the Zoological Gardens of London were fed upon the thighs of horses. These being large and hard, they were unable to break and eat, and as a consequence their young were born with ceft palates and died shortly after birth. They were afterwards fed upon deer and other small animals, and their young were born with perfectly formed palates and lived. Vetinary surgeons have long known that certain diseases of their dumb patients can only be successfully treated by feeding them with bone meal. A dam too aristocratic to gnaw bones, gave birth to successive litters of rickety colts. After being fed with food containing bone meal she produced perfectly healthy ones by the same sire.

Even our domestic herbivorous animals thrive better when bone is added to their bill of fare. The cow who every year gives birth to young has an excessive drain upon her supply of bone material, and craves bone to such an extent that she will try to masticate even very large ones, as every farmer's boy can testify.

Arguments in favor of eating bone to prevent decay of the teeth as well as to cure a long catalogue of bone and kindred diseases might be continued indefinitely, but, as a "word to the wise is sufficient," it seems only necessary to add that a long and continued experiment has been made upon a family, with results that fully justify all claims made for it. The bones were selected from perfectly healthy animals, none being used that bore the slightest blemish, carefully and without being allowed to pass through any perceptible chemical changes, finely granulated, and incorporated into soup, gravey, bread, etc., in the proportion of from one to three spoonsful to each pint of soup, gravey or flour.

The relative proportion of nutritive elements in one hundred parts of different kinds of animal food has been found as follows: Beef, 26; Mutton, 26; Chicken, 27; Pork, 24; Blood, 20; Brain, 21; Codfish, 21; White of egg, 14; Milk, 7; Bone, 51.—*Medical Tribune.*

ARTICLE VII.

CHROMIC ACID IN AFFECTIONS OF THE TONGUE.

Mr. Henry T. Butlin, F. R. S., has used chromic acid in certain affections of the tongue, with markedly good effect. In June, 1881, he treated two cases of glossits with a ten-grain solution of chromic acid in water, painted on the sore areas of the tongue three or four times a day. Both cases improved. A case of secondary syphilitic, deep and jagged ulcers of the tongue, and ulcerations of the inside of the cheek, which showed no improvements under hyd. c. cret., iodide of potass. or liq. bichlor., were, after a week's treatment with chromic acid solution, almost completely healed. Another case of flat mucus tubercles, due to secondary syphilis on the right border of the tongue, which had resised treatment with hyd. c. creta for about three and a half months, was almost completely cured in three weeks.

Mr. Butlin has used chromic acid in several different inflammatory conditions of the tongue, in many cases with cases with most gratifying success. In 27 cases, 20 have been cured or greatly relieved, seven having received little or no benefit. The seven cases were either of chronic superficial glossits, or of *tertiary* syphilis. The twenty include seven of chronic superficial glossitis, and thirteen of various *secondary* syphilitic affections. Mr. B. concludes that chromic acid cures with marvelous rapidity *secondary* affections, ulcers, mucous tubercules, and condylomata. It produces no appreciable effect on *tertiary* affections, gummata, extensive ulcers, or tubercular syphilides. Some cases of chronic superficial glossitis, with slight ulceration and renewed inflammation, are rapidly benefited by it. In cases glossitis in which the tongue surface is attacked by a fresh inflammation of great severity, glycerite of boracid acid and soothing remedies are more suitable, chromic acid rendering these worse. He reports one case of *tertiary* syphilitic ulcers of the tongue which was cured in about two months by combined chromic acid and mercury treatment, although it had obstinately resisted purely anti-syphilitic treatment for many months. The strength of the solution usually employed is grs. x–Drams j water; in some cases grs. xv–Drams j. The patient is told to paint the diseased parts three or four times a day with a camel's-hair brush dipped in the solution. There is seldom any pain or discomfort; sometimes a little smarting at first.—*Med. News.*

AMERICAN DENTAL ASSOCIATION.

The twenty-fourth annual meeting of the American Dental Association will be held at Saratoga Springs, N. Y., commencing at 10 A. M., on Tuesday, August 5th, 1884.

GEO. A. CUSHING,
Rec. Sec'y.

EDITORIAL, ETC.

Answer to an Unprovoked Attack.—In the June No. of the *Independent Practitioner* appeared an article by Dr. B. Merrill Hopkinson, a graduate of the Baltimore College of Dental Surgery, in which he charged the present faculty of his *alma mater* with having, at its last commencement, graduated a number of gentlemen without requiring of them attendance upon the lectures, demonstrations, etc. In the July No. of the same Journal appeared a "reply" to this article of Dr. Hopkinson, signed by the faculty of the Baltimore College, which consisted of an altogether unprovoked attack upon the Dental Department of the University of Maryland, on the ground that Dr. Hopkinson is a member of the faculty of the Dental Department, and that the facts he stated could only have been obtained from the Dean of the latter institution. To this attack, the Dean of the Dental Department of the University of Maryland replies in a statement made under oath, and which will appear in the *Independent Practitioner* for August 1884. Dr. Gorgas in his answer to the attack, states in the first place, that Dr. Hopkinson is not connected with the Dental Department of the University of Maryland, having resigned his position as Demonstrator before the article in question was written, and subsequently to the publication of the annual Catalogue of 1884. Also that the faculty of the Dental Department of the University of Maryland had nothing whatever to do with Dr. Hopkinson's article, for which he alone is responsible. The "reply," of the faculty of the Baltimore College alleged that Messrs. Meeker and Barlow (two of the cases referred to by Dr. Hopkinson,) were guaranteed diplomas and promised easy examinations by Dr. Gorgas. Such a statement Dr. Gorgas denies most positively, although he was repeatedly urged by the two gentlemen to secure for them easy examinations, and asserts that he has never, during a period of of more than a quarter of a century of connection with dental schools, guaranteed a student a diploma or promised easy examinations. Dr. Gorgas in his answer also asserts that, owing to eighteen or twenty years of practice, reputation as dental practitioners, and home business, Messrs. Meeker, Barlow and Baldwin, who applied to Dr. Gorgas (the first two having matriculated at the Dental Department of the University of Maryland and attended some of its lectures, besides dissecting, &c.,) an arrangement was made with these gentlemen, by which during two sessions, they could meet the requirements of one session. Also that the only reason why these gentlemen went to the Baltimore College was that by doing so they could obtain a diploma without passing more than a day or two at that institution, whereas if they had continued at, and attended the University of Maryland some three months attendance at least would have been required of them. As regards another case, that of T. H. Schaeffer, also referred to by Dr. Hopkinson, the faculty of the Baltimore College alleged that Mr. Schaeffer (who had been out of practice for some eight years, and who applied to Dr Gorgas for a diploma on *no* attendance,) when he approached Dr. Gorgas, supposed him to be the Dean of the Baltimore College. Dr. Gorgas in his answer to this statement, positively asserts that Mr. Schaeffer made no mistake whatever, as he stated that he had been told that the diploma of the Dental Department of the University of Maryland was worth a great deal more than that of the Baltimore College. Dr. Gorgas also asserts that he refused point blank to permit Mr. Schaeffer to enter the University at the end of the session, and informed him that a full session would be required of him. Also that Mr. Schaeffer stated in one of the dental depots of Baltimore shortly after his interview with Dr. Gorgas, that he had been refused, but that he could obtain a diploma from the Baltimore College, as the Dean of that school had told him he could return home and come again to the Baltimore College at the end of the session for an examination. Dr. Gorgas asks what would be the nature of such an examination, when the appliant had been out of practice for some eight years, engaged in the manufacture of agricultural implements, and had never applied himself to the study of dental science? In regard to the cases of Messrs Dowsley and Twitchell, also referred to by Dr. Hopkinson, and who, after being at the Baltimore College for some days, and declaring themselves dissatisfied with that school, matriculated at the University, and a few days afterwards returned to the Baltimore College—Dr. Gorgas, judging from the letter of these gentlemen is of the opinion that such a return was occasioned by his refusal to credit these gentlemen with certain examinations they had passed as juniors at the Boston Dental College, for they informed him that they had made more satisfactory arrangements with the Dean of the Baltimore College.

In regard to a charge made in the reply of the faculty of the Baltimore College, that one of their students had been offered easy examinations and been guaranteed a diploma by Prof. James H. Harris, this gentlemen positively denies ever having made such an offer to anyone, and declaims having ever had the power to do so. The name of the student in question, however, is not given in the reply of the faculty of the Baltimore College. The above is a mere abstract from the answer of Dr. Gorgas to the altogether uncalled for attact of the faculty of the Baltimore College on the Dental Department of the University of Maryland.

INFORMATION WANTED.—We have before us a postal card containing a call for a meeting of the faculties of the Dental Colleges of the United States, to be held in New York City on August 4th, and also the notification that a preliminary meeting for conference will be held in the same city on *Sunday* afternoon, August 3rd, the same card being signed by the Dean of one of the Colleges as *Chairman*.

What we wish to know is by what authority a Chairman has been appointed prior to such a meeting being held; and also if there has already been a meeting of but a few of those interested, at which a course of action has been concocted?

We remember an "Association of Dental Colleges" in time past, which held several annual meetings, but which came to an untimely end by the refusal of a certain school in Philadelphia to depart from a rule it had established of graduating appliants on 12 years of practice and an examination.

If we were assured of the sincerity of this movement, and were convinced that any proper legislation by such a meeting would be strictly adhered to, nothing would give us greater pleasure than to participate. In our judgement any action determined upon at this meeting should be afterwards submitted to the faculties of the different dental institutions for their approval or otherwise.

The idea of one member of a faculty deciding for all of his colleagues, is indicative of something that had better be closely examined into before it is adopted.

THE NEW BUILDING OF THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MARYLAND, is now about completed, and presents a structure imposing in appearance and arrangements, having been erected especially for instruction in practical dentistry. Another great advantage is that this fine building is owned by the University, and is erected on its grounds, in such a location as commands unobstructed light from *every* side. Notwithstanding the obstruction incident to the erection of new structures, the Infirmary practice has been exceedingly large throughout the entire spring and summer, and the class in attendance has had all the practical work both in operative and mechanical dentistry that could possibly be attended to. The dental students have also the advantage of attending the daily clinics at the University Hospital on Oral and General Surgery, etc., etc., throughout the spring and summer.

MONTHLY SUMMARY.

A DENTIST'S BILL.—The following appeared in the New York *Times* of July 2nd, concerning a bill which was sent to Gen. Blanco, the Venezuelan President, last week, for professional work, for Mrs. Blanco and two of her daugthers. The three ladies, acting on the advice of a friend in this city, went to Dr. Atkinson, at No. 41 East Ninth-street, and arranged with him for treatment. This was one week ago last Monday, and as the President and his family were going to sail on the following Saturday, there was necessity for haste. Dr. Atkinson set aside other engagements, hired additional help, and went to work. The day before the family sailed, the ladies left the doctor's office believing that their teeth were as sound as dental skill could make them, and professedly satisfied with the work.

A bill was sent to President Blanco charging $7,000 for the service. He was somewhat astonished at what he believed to be an enormous price for four day's work, and showed the bill to a friend. The friend was likewise astounded. He put the bill in his pocket, took it into the billiard-room, and told the story as a capital joke to his acquaintances. It was repeated over the billiard tables, drifted into the bar-room, stirred up with the social milk punch, and was chuckled at by professional men in the reading-room. President Blanco was not at all pleased with the notoriety he was getting, and would have paid the bill to avoid publicity, but his friends dissuaded him from doing so. The gentlemen to whom he had shown the bill in the first place, called on Dr. Atkinson, and suggested that perhaps there was a mistake.

"Oh, no," said the doctor, "not at all. That is the amount of my bill."

The friends went away protesting that the sum was an imposition and would not be paid. President Blanco went away, and left a sum of money (said to be $1,500) in the hands of a business firm whom he had some dealings with, requesting them to come to an amicable settlement if they could do so.

Dr. Atkinson lost his temper when he heard that other people were inclined to interfere in his business and make the matter public, but he declined to have anything to say for purely professional reasons. A fellow-dentist, who had talked over the matter with Dr. Atkinson, and was acquainted with the facts, said: "Dr. Atkinson considers his professional services worth $50 an hour, and if people go to him I suppose they must expect to pay him his price. Mrs. Blanco knew that her bill whuld be large, though there were a few charges which she probably did not take into consideration. Dr. Atkinson's three sons are engaged with him in the business. When he employs them on his own patients of course he pays them by the hour. I am told that the dentists worked with the three ladies in the chair from early morning until dark, and the artificial part was done on extra time in the evenings. Of course that went into the bill. Then, at President Blanco's request, all other engagements were set aside until this work was done. That involved loss of custom, which was probably taken into consideration."

Dr. Atkinson displays in a frame near his operating-chair engrossed resolutions from the money-order department of the New-York Post Office, thanking him for saving the life of their Superintendent by curing an attack of "necrosis of the jaw, a painful process of decay."

If a compromise is not reached an appeal will be made to the courts.

TEXTILE METALLIC FILLING.—It is now about two years since Dr. Jerry Robinson introduced his textile metallic filling material. During this time it has not only been brought to the notice of the profession pretty generally, but it has apparently won a place for itself among the lists of filling materials that is high up among the reliables.

Two years time is scarcely sufficient to judge of its enduring qualities, yet the test of this time gives great promise for the future. With many, it has taken the place of amalgam in about eighty or ninety per cent. of cases; this alone is a good recommendation for it.

We, in common with others, have used it largely for the past couple of years and find, so far as we have yet been able to see, that it returns well for the labor of putting it in. It is not advisable to introduce it in very large pieces, as they cannot be handled with accuracy. The filling may be started with a cylinder or wad, the balance packed in, in the form of strips, such as heavy gold foil is cut into. *Thorough* malleting throughout the whole process of filling is very necessary, for, if not made dense, the filling, especially one on an approximate surface, will distintegrate under the wear of mastication. In preparing cavities on the proximate, surfaces of bicuspids and molars, it is best to cut the lateral walls perfectly square, as, if they are flared, it is next to impossible to make the joints perfect, and besides this would leave a very thin portion of the material to guard the enamel.

It adds greatly to the density of these fillings to use a matrix, as the mallet can then be used liberally and without fear of dislodging any portion of the filling. The only objection so far apparent is, that when used in combination with gold and both metals exposed to the fluids of the mouth, the textile material will become black.

This is a slight fault that may be remedied to some extent by not exposing the material in places where it will be seen. Furthermore, the darkening appears to be on the exposed surface and not in the interior of the tooth. If no harm results to the tooth from the discoloration of the metal, it may pass without comment.—*Dental Register*.

ACID DYSPEPSIA.—In a paper read before the Manchester (England) Medical Society, Dr. McNaugh claims, from experiments made on himself, that the acid which causes the irritation in heartburn is hydrochloric acid. He analyzed matter obtained from his own stomach when he was suffering from acidity, and was thus led to the above conclusions. He further showed that the tendency of hydrochloric acid is to prevent lactic fermentation, and he adduces this as additional evidence that the acidity in acid dyspepsia is not due to lactic acid.

We are willing to concede the fact as above stated, but we repudiate the deductions. The author of the paper displays that unfamiliarity with this subject which is at the root of the empirical and often mischievous treatment of acid dyspepsia by means of alkalies, etc. This condition may be due either to an excess or a deficiency of hydrochloric acid, and the treatment differs accordingly. When hydrochloric acid is deficient, the process of normal digestion gives place to fermentation, in which lactic and butyric acids are both generated. In the case of excessive secretion of hydrochloric acid the acidity will be found to be greatest either before meals, and is relieved by food, or immediately after meals. In deficiency of this normal ingredient of the gastric juice the food remains undigested, and in from two to four hours after its indigestion, according to the nature of the food, fermentation and acidity supervene. In the latter case the eructations are not only acid but peculiarly irritating in the œsophagus. the existence of butyric acid being particularly apparent to the taste.

In the treatment of each of these varieties of acidity, or acids are to be exhibited but in an intelligent manner, and in conformity to the physiological law that acids check acid secretions. The exhibition of hydrochloric acid in combination with the simple bitter tonics one or two hours before meals overcomes to a degree the excitability of the glands, and thus renders them less susceptible to the irritation of food, the bitters assisting, by their direct tonic action on the tissue, toward permanent relief. When a deficiency of hydrochloric acid is secreted, this should be supplied immediately after each meal. The acid given at this time facilitates digestion, and thus prevents that fermentation which manifests itself in lactic and butyric acid eructations. The joint exhibition of pepsin in such cases aids in digestion.—*Medical Age.*

GERMS AND GERMICIDES.—J. C. Peters, M. D., writes: Carbolic acid, so-called, is not an acid, but an alcohol, and bacteria will live in alcohol for months. Nedwetsky made experiments on bacteria, in 1872, and found that they lived in strong solutions of carbolic acid; to strong to be used upon sick persons. Calomel and quinine also did not kill them, nor nux vomice; while dilute acids—nitric, surphuric, and tartaric acid, killed them, in five per cent. solutions. Tannin and gallic acid are also efficient germicides. Corrosive sublimate, one to twenty thousand parts of water, is safe and good; also iodine, one to five thousand of water; and bromine, one to fifteen hundred of water; chlorine water requires two days to kill them; a five per cent. solution of chloride of lime, ten days. Sulphurous acid, generated by burning sulphur, the most commonly used disinfectant, requires thirty minutes to kill them; and the spores in micro-cocci will often live ninety-six hours in it. A five per cent. solution of chloride of zinc requires a month to destroy them, and they have been found alive and active at the end of that time. Turpentine, which has always had an approved reputation against puerperal fever is active against bacteria, in one part to seventy thousand. The oils of peppermint and cloves are equally efficient. Benzoic acid, and benzoate of soda are inefficient.—*N. Y. Med. Planet*

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ARTICLE I.

THE TEETH AND THEIR TREATMENT.

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The structural condition as lesions of the teeth not only affords a certain index to the habits and customs of the present possessors, but reflect back ancestral, through an indefinite series of generations. Even favorable indications interposed and continued for a few successive birth scores leave improved impressions which cannot be concealed from the observing dentist of quick perceptions, notwithstanding neglect and direct injury have again resumed their sway. To the physician who devotes his attention to the treatment of chronic diseases, these hereditary impressions offer a far better means for the detection of characteristic taint than the patient's rehearsal of symptoms can give, except of those from recent acute accession. In ratio with the grade of material, and perfection of union in the structural affinites of the teeth, correct judgement can be formed of the deviations of the osseous system from a normal state; although, in fact, there is no reflex action, and the constituent elements of the teeth differ in composition and density of cohesive arrangements from the flesh-covered bones of the body. The development of the teeth from the pulp expansion of the nerve vessels and neurotic sheath, through which the formative supply of material is derived, shows clearly in the varied elements of the deciduous and permanent sets a special secretive offset from the ossific laboratory designed for their production. The type of this vicarious functional offset is readily recognized in the nacre excretive formations of the oyster and kindred mollusks, for self protection, in addition to subserving the purposes of teeth. This alien adoption and its object is demonstrated in the partiform exposure and adaptation of the crowns for the mill purposes of attribution in grinding food for special fluid admixture in furtherance of digestion. The pulpy and other conditions of the infant at birth would aptly suggest that in original formation the human system became a body corporate by a united organic communism for combined generative propagation in sexual intercourse. This would seem to admit of proof from conchoidal resemblance, as there are perfect shell representations of all the external organs of sense and reproduction that belong to the human body, while the inhabitants in organic likeness enact in isolated counterpart the functions which would distinguish them as representative organisms of the human system. The eleboration, characteristic elements, and formative adoption of the teeth by the jaws, directly imitate, in pulp excretion, the shell formation of the oyster. *The deciduous teeth* in normal coaptive development with the osseous models of the infantile jaws, practically exemplify in constructive material, and class, forms designed for special service in the varied process requirements of mastication, the first stage of a provisional economy intended to fulfill at maturity, functional demands in the preparation of food for an omnivorous organic community. If the deciduous pulp is examined with magnified power in the process of development, its oyster-like simplicity will appear in strong contrast with the secreting membranous folds designed for the combined excretion of the enamel-nacre, cementum, and osteo-dentine, which, in adaptative reduction, become the highly vitalized centre and root sheaths of the permanent teeth. Yet, with the evident increase of vitalized power necessary for the elaboration of structural material requisite in laminated and concentric combination to sustain intact the relation of parts to resists erosive agencies and functional attribution, at maturity, the semi-alien alliance of the teeth with the animal body remains the same. With a perfectly normal predisposition the nacre, or "milk teeth," are excreted from, and modeled by, the pulp with an exact relation in size and order to correspond with osseous formation of the jaw, insuring regularity and structural conditions necessary for the healthy fulfillment of their limited period of service. The "fifth year teeth," when they emerge from the gum at the masseter angles of the jaws, represent a distinct era in child life, inasmuch that they foreshadow in structural formation the degree of perfection of the permanent set, while they retain in reflection the nacre impression of the deciduous. As the influence of mouth habits preserve or impair the natural integrity of transmissible material impressions, the artificial deteriorations practiced for the creation of morbid appetites by the past and present civilized generations, have in train caused diseased constitutional defects, which have entailed upon the infant in utero a pathological inheritance that in teething reflects back to its mouth source. When the normal conditions of a natural birthright are fulfilled, the bony ossification at the apex of the jaws proceeds in pari passu development with the nacre teeth, and when they are matured afford, at the "cutting" period, a firm fulcrum support for their easy exit through the gum integument. In the same manner, and like exactness, the second teeth oppose their cutting edges and grinding surfaces to the points of the deciduous roots, and by absorptive pressure supplant and subextract their crowns with anæsthetic freedom from pain. But, with the insatiable habits begot from the narcotic stimulation of tobacco, malt, and other spirituous liquors, the exceptions to mal-formation, irregularity, painful dentition and rapid decay from the local renewal of cause, are in near approach to the zero of non-existence. As the suffering of the infant in teething are entailed with an enforced life, passion begot, in reckless disregard of cause and effect, they have an especial claim for the sympathetic study of the dentist. As in speech, taste, etc., the mouth adjuncts are indicators of remote bodily emotions and functional aberrations in more advanced life, so in infancy to the pulp developing teeth, and rudimentary jaw ossifications, may safely be referred, under existing evils, death, is the providential deliverer from an inherited existence of suffering. When the incipient teeth and jaw osssfications are lacking in well affinitized material necessary for perfect combination and mutual stimulus in the process of development, the assistance of the mother's fingers can be rendered serviceable, under directions, to supply the aid required by nature.

Even in the more matured state of the jaw in childhood, that precedes the appearance of the second incisors, mothers dutifully interested, and obedient children have, under the dentist's direction, averted irregularities by the stimulating use of their fingers in expanding them by pressure. When at fully matured puberty the wisdom teeth complete the sum total allotted to the series in dentition, they present in greater or less degrees of perfecting the crowning foundation for the exercise of the dentist's reparative art. Or if benevolently predisposed, with patrons inclined to reciprocate his interest in their welfare, ready to advise means adapted to structural peculiarities for the preservation of the teeth in freedom from decay.

THE PERMANENT TEETH.—In keeping with their semi-alien formation and adoption by the jaws are separators, comminutors, and grinders of food for organic nutriment, the teeth, in normal perfection, possess, as shown, structural adaptations for self preservation, in comparative freedom from the action of chemical agencies generated in the mouth and stomach, as well as from the wearing attrition of their cutting and crown surfaces in working contact.

By passing in review the more complex secreting and excreting conditions of the nerve vessels, neurotic sheath, and pulp expansions, required in the formation and adaptation of the permanent set to increase in growth of jaws to the terminal period, the structural limits of comparative insensibility from the acutely sensitive, will be readily recognized, and render clear the adaptability of materials and methods of adjustment necessary to be employed for safely fulfilling the preservative resources of the dental vocation. As appears in formative process, the excretive pulp acts as a model to each class of teeth in quadruple correspondence, reflecting from side to side of each jaw peculiar indentations and defects; although, from some local cause the secreting membranes often fail to preserve the same structural unity in the supply and material affinites of composition.

The outer membrane is the secreting and excreting medium of the nacre-enamel, the required fibrine, etc., being supplied from self-absorption in the process of crystalization, the quality of each being determined by the hereditary normality of the general system.

As the structural formation reveals, the depositing membrane of the cementum is involved with that of the nacre-enamel in the line of distinction, uniting the outer semi-crystaline with the inner fibro-laminated, embracing in combination the resisting and non-conducting qualities required for the protection of the more elastic and sensitive dentine in its connection with the vitalized pulp. These two stage processes of model formation are affected from below, independent of the osseous radii maturing for the alveolar socket enclosure of the root. Seemingly, after these oyster functions of the pulp have excreted and formed the protective shell, destined to be exposed to the vagaries of artificial habits cultivated by human beings, it enters into, an osteo-alliance with the secretive functions of the jaws producing dentine, which extends its crown-covered body downwards and forms the roots from internal secretion, within the duplication of its outer fold, which, with the completion of the ossific process, forms the alveolar lining membrane of the root and socket. The dentine invests and forms the pulp cell, and from continued functional attachment is known to deceive from it reparative aid in kind, when exposed.

The "pulp" is the highly vitalized centre, and is the excreting formative source of the structural elements entering into the varied combinations of tooth substance, acting as the terminal constructive expansion of the neurotic sheath and nerve vessels for the transmission of material; its functional duties cease with the death of the body, but is much more frequently terminated by the broach and forceps of the dentist.

DENTAL FALLACIES.—The same emperical infatuation has retarded the preservative progress of operative dentistry, that has attended the general and special practice of medicine since their first professional inauguration as checks to disease. Yet, from their semi-alliance with the human body, and peculiarities of structure promised in adaptation to functions that required insensibility to force and grinding attrition in contact, the teeth present certain indications necessary to be followed for their preservation in freedom from decay, of which use and cleanliness are the chief. When decayed, and the dentist's service is required for their repair, it would appear legitimate that he should understand the bearings of their relation, and extent of functional reciprocation that they hold, as instruments of service, to the organs of the human system, in order to secure a successful result to his labors. From the aid of preliminary observations founded upon the experience of self sensation, in comparison with the teeth of his patients, he would be able to detect the cause of structural deficiencies, and from the knowledge obtained would be able to judged correctly of the methods taught for the arrest of decay, and thus, step by step, within the range of self approved security, would make his progress certain. The oyster-like simplicity of formation in structural combination, with well defined uniting lines of demarcation between the nacro-chrystaline enamel, which is free from elasticity, and cementum—which is the ivory of teeth—and possesses kindred affinities, with elasticity and its comparatively non-conducting qualities, acting as an intermediate shield for the protection of the more highly organized dentine which remains in connection with the pulp, the teeth would seem to offer a chart of direction for the reparative art of the dentist bordering upon the infallible. Especially, as there is no reflex functional neuralgia from pulp-irritation, and inflammation, as the local influences of disease are imparted from alveolar contact of the teeth with the jaws. The pioneer dentists of fifty years ago were obliged to rely chiefly upon their own test experience, as there was little recorded anterior to serve as a guide to their operations. This dearth necessitated extreme caution and practical forethought, so that there were but few missteps that required regretful reconsideration. In filling—the main source of income to the dentist—they used only hand pressure, the more fastidious giving a surface finish with slight touches of the mallet; even the faint jar it caused was a source of dread to the patient; and in cavities that reached the dentine the hand of the operator rarely ventured its use, from fear of ulceration.

As a guard against the excessive flow of saliva, their sole reliance was placed upon the use of the napkin, and instead of water injected from a syringe, to act as a detersive for the removal of decayed matter, the secretions ejected from the glands served the purpose.

In addition to the primitive cleanliness of the means, the modern dentists, with proclivities for fashionable empiricism, have often expressed in print their wonder at finding the walls of the cavity perfectly free from decay, after having removed a slightly impacted filling of ten or more years' service, to be replaced by a "first-class" substitute, engine welded, within the rubber screen of a coffer-dam. If they had, even by comparative analysis, tested the effect of water in the cavity of a tooth prepared for filling, in contrast with the *peculiar* antiseptic qualities of the various glandular secretions thrown into the mouth for food commixture, they would have found in water the active elements for the continued decay of the tooth substance, while in opposition the saliva possesses the inmate essentials of retardation. Aside from the constituent resemblance to the gland fluids of the mouth to those of the nacre secretions of the oyster, the relish the latter affords as the most congenial of carnivorous edibles, is proof presumptive of a natural alliance in the formative and preservative conditions of the teeth The frequent injection of water into the cavity of a tooth in the preparatory process of excavation must, of necessity, leave an impression of dampness, however careful the operator may be in the use of absorptives and actual heat for evaporation; and as its constituents are the active source of fermentative decomposition in vegetable and animal matter, and of reactive oridization, in a greater or less degree to mineral, the effects likely to be produced by a metallic substance in contact with diseased dentine can be readily anticipated, in process, by an analytic mind.

Or if his experience has failed to note the impression of water in reaction upon dentine in contact with a metallic filling, in contrast with saliva, the experiment would prove satisfactorily to the dentist, and more especially to his patient. The non-conducting properties of saliva in opposition to water can be made apparent by placing a dossil of cotton wet with each, alternately, in the cavity of a sensitive tooth; or by immersing extracted teeth, with the dentine exposed, in saliva and water separately, the contrasted effects can be tested; but the saliva must be free from contamination for the development of its conservative properties. For cleaning the teeth, water is indicated, as it removes adhesive matter from the enamel, and allows the preservative qualities of the saliva to come in direct contact with the surface. We know, from self observation, that when hungry, the odor of cooking food excites, in anticipation of its relish, a flow of saliva, and that gradually, as our appetite becomes appeased, it decreases in proportion, and if eating is persisted in, when the gland stimulation ceases, *as the sure sign of enough*, the teeth become dry and cumbered, and deglutition difficult. If these natural indications of limit in mouth service could be placed within the control of childen by education, the personalities of the community would be greatly benefitted in health and comfort, although the physician and dentist might suffer in pocket. *The Painful and Destructive Fallacy* of engine "plugging" is still more apparant to reasonable judgment and repugnant to natural indications, than the use of water as a detersive agent for removing excavated decayed matter from the dentine-exposed cavity. From the compactness and varied density of the three composite parts that enter into the structural formation of the teeth, the effect of the destructive agencies is different in action on each, but bears no resemblance in either to necrosis or other diseases that effect integument covered bones; yet, as with the chelonia carapace shell protections of the toes and fingers, are extremely liable to infect the bones when subject to ulceration. But if, from fore-knowledge, and as a providence for the retardation of prospective degeneration, the teeth had been designed to afford a season for repentance, it would exceed the constructive power of man to suggest an improvement. Even the carapace nail defenses of the toes and fingers show a wonderful adaptation of means to ends, in the firm elasticity of their composition and attachment for the effective accomplishment of intention as shields; but, if we consider the service required of the teeth for the healthy prolongation of vitality, their more complex provision for safety excites in a higher degree our admiration.

Still, with unreason, mans' invention often tends,
Beyond the useful, and in self-destruction ends;
The dentist with lack of reason o'er acts his art
When for engine mallet he thrusts the jaws apart.

Although the structure of the teeth, and method of adoption, admits of hard usage in the grinding service of their vocation, when slightly diseased the immunity from painful irritation is lessened; but even in superficial cavities from fissure tendency to decay, which penetrate but little below the surface of the cementum, the safe course is to use as little force in excavation and filling as is consistent with through preparation for the permanent adjustment of the material used to arrest decay. The causes ot decay in teeth must, of necessity, vary in degree, the intensity of irritation, and render them more or less susceptible to external impressions, and the treatment should vary in accordance with structural imperfection and indications of the exciting cause of decomposition. Upon the adoption of this course for the cultivation of reason and judgment depends the dentist's merits for the professional distinction of doctor; but if he regards a tooth cavity as a hole to be filled with gold, welded by the strokes of a machine mallet, and finished up to class rules, heedless of vital alliance and regulation of force, the title of tinker would better distinguish his characteristics of worth. For the development of worth and support of professional dignity, collateral literature should be cultivated as a criterion of thought capacity. A lack of this, the only means of opening to public view the resources of mind, has reduced to the grade of empiricism the educated of the medical profession; as modesty and scorn will withhold their tongues from the cajoleries practiced in self praise by the charletan.

By the practice of thought discipline to interest, and raise the standard of public intelligence, there will be a mutual reaction for the benefit of each, both in professional and social intercourse, that will prove a source of reliance and stimulus to mental exertion on the part of the dentist. To the "crumb item," condensed, and scrap opinions, is mainly due to the diversity of materials and methods adopted in dental practice to obtain uncertain results. For a long period dentists complained that gold balled or curled under the blows of the "plugger," and the gold beaters tried all their metallurgical resources to render it in preparation pure, soft and pliant; but, with their almost perfect success, it was impossible to make it fulfill dental expectations when driven with the quick blows of their engine trip-hammers against elastic walls of dentine. Then came the wail, that gold-filled lateral cavities having a dentine base and walls in relative proportion to depth, would decay around the filling, "no matter how well condensed it might be;" and, without the slightest reference to cause, various suggestions were offered to remedy the defect; and at the present time "first-class fillings" of the description frequently have a gutta-percha base, with side patches of amalgam, all the work of the same dentist. Without other knowledge than an intutive perception of physics, the cause should have been apparent from the demonstration; the gold "balling" and curling upward around the points of the "plugger" from the quick blows in recoil, bespoke with mathematical certainty the impossibility of making semi-plastic material adapt itself in close contact with the elastic walls by the process.

In second consideration, his acquired knowledge should have taught him that organized dentine, when irritated, became an erectile tissue, and if imflammation and ulceration of the pulp did not succeed, shrinkage would, leaving an inevitable space between his "first-class filling" and walls of the cavities. If, in addition, he would examine his engine work with a critical eye, aided by magnifying power, he would discover in the grade closeness of adaptation the varied density of substance that enters into the composition of the teeth, from the clear lines of impressed demarcation caused by the degrees of structural elasticity between the naçre-enamel, cementum and dentine. A farther investigation of the connection existing between the dentine and pulp would enable him to calculate the probable chances of the latter's inflammation and ulceration from the effects of engine concussion.

It is well known that the pearl oyster (*Aviculidæ*) can detect the first attack of his enemy the teredo aviculœ upon his shell, which gives him time to deposit and unite an effectual wall of pearl-nacre to intercept the course of its bore, and as it is impenetrable to the forcep cutting jaws of this sea worm, it forms a safe barrier in the direct line of its intended entrance; but as foilded appetite begets a corresponding sagacity to overcome obstacles opposed to its gratification, in every grade of animal life, from the poly-podo-vegetable to man, the boarer commences a sinuous course beneath the soft phosphate on the surface of its nacre attachment, untill he finds a thin and penetrable portion of the shell, through which he makes a quick entrance and secures his prey. Then the oyster, as in the death flurry of the whale, looses all command over its resources of plastic defense, and while struggling in death agonies from the gnawings of its voracious foe, yields himself, with its life, "contoured" into pearls the most beautiful symbols of soul existence that it is possible to conceive, with the sole exception of a comely woman's teeth when they reflect in purity the "angelic" mind of their possessor. This flurry was suggested in question whether the pulps of of human teeth have their oyster prototype's power of resisting "bacilla', and other vermiform species of invasion with reconstructive dentine? There is certainly abundant testimony in proof that, with proper treatment, the excretive functions of the pulp can be revived in sufficient degree for the formation of a protective shield of dentine, but with a nearer resemblance to the cancellated structure of the jaw than the original, showing that there had been a change in the elementary secretion from disease, or that after the second set was completed the pulp adapted its functions to the osseous source of supply. Sixty years ago Dr. Harwood of Boston, recommended the use of cotton saturated in a melted combination of bayberry wax, two parts, to one each of creasote and oil of cloves, as a cap covering for exposed pulps; and to this and similar applications we are indebted for the knowledge that with judicious protection they can form a substitute shield with the characteristics of dentine. But after the plunge of an engine bur, directed by careless hands, into the substance of a pulp, there is but a small change for its salvation, although slight wounds from the excavator heal readily. At the present day, within the attesting scope of a few correspondents, there are upwards of five hundred hand manipulated gold fillings, having a broad dentine base in near approach to the pulp, with various degrees of finish, from ragged to smooth, that have a painless service date ranging from twenty to fifty years; while in comparison, they acknowledge that there are but few engine-filled lateral cavities with a dentine base and walls that have eked out, with patching, a term of ten years. The invention and introduction of the Snow and Lewis automatic surface finishing hand instrument was a serviceable improvement over the hand mallet, inasmuch that it left a free hand to the operator, but its stroke was labored, and lacked in other essentials that would render it safe to use as an impactor within the boundaries of diseased dentine; yet, by a large proportion of those who express their judgment, unbiased by the vageries of advertising fashion, it is considered the best aid of its kind an advance of hand pressure.

"*Pivoting Teeth*" with wood demonstrates clearly the danger that is to be apprehended from the jar of the mallet; for, with the custom of striking home to its bearings a tooth with a close fitting pivot, ulceration of the root and alveolar caries were first introduced as an attendant upon that inconsiderate operations of the dentist. It was an expressed source of self-gratulation to Dr. Harwood, that never, to his knowledge, had a patient of his suffered from having a pivot tooth set, and he justly attributed the cause to his method. He used second-growth walnut wood, and prepared the size to suit by striking them through the grade holes in a screw plate, then immersed them in tincture muriate of iron until the pores were completely penetrated, and after they were perfectly dried with slow, artificial heat, subjected them to the action of equal parts of creasote and oil of cloves. In preparing a pivot, he obtained an exact fit, so that a junction could be obtained without other force than the use of his fingers, and in two instances reported, the teeth were firmly retained twenty years without being re-set. In none of the adjunct processes of the dental art, has there been so near an approach to letigimate perfection as in the manufacture of artificial teeth, by those who devote their attention to it as a specialty; but as in other departments, vaunts, gold medals, and fair diplomas, are not to be trusted as truthful tests of superior excellence.

Gold, and other fillings, although useful in the retardation of decay, are but blots that deface the architectual beauty of the mouth, and should act as beacons of warning to the human family, that the gratification of abnormal appetites begets like heedless passions, which entail in conception upon the resistless embryo, not only the structural defects of the teeth and their deformities, which have given birth to the dental profession, but a predisposition to all the diseases which effect the body corporate, which as guardians of the life sustaining portal, they act in the capacity of preparatory indexes.

Woman's Fitness for the Dental Profession.—There is but little doubt that with cultivation woman could develop all the essentials required for successful dental practitioners. But would the vocation prove congenial to the evident designs of nature instituted to govern the mutual division of labor responsibilities between the sexes? Already in America we observe the rapid ingrowth of familiarity between sexes, which is the offspring of foreign inoculation bred from an appropriate labor distinctions. Labor is not only a democratic equalizer, but it would prove a brutalizing source of degradation to the weaker sex if established upon a common grade. The proof of this axiom is demonstrated in the family relations of the German peasantry, both in the mind and matter of their personalities;—if the former can yield more than the mere supposition of its existence, as an attribute of mankind, rather than an effect from its actual impression. With the few ingrafts of women into professional life which have been accomplished, we can feel and foresee with its full realization, the utter annihilation of all the ideal charms of mother and home, the centres of an indwelling and enduring affection which clings to our memories as the ivy of hope to the latest thought and breath of life.

But as experience is the best practical and least heeded teacher of life, an example as an exception to common indifference will prove instructive, even if it lacks the full influence of persuasion.

Extracts from a letter from Miss———, to her Dental Instructor:

* * * RUSSIA, * *

MY DEAR AND HONORED TEACHER:—

I will not attempt to express the emotions of gratitude the reception of your letter caused, or the feelings of thankfulness for the strength which enabled me to overcome my prejudices against adopting an assumed name, as you advised, while practicing abroad a profession which necessity forced upon me as a choice. Above all the influence of your persuasion which made me limit my practice to the sole treatment of women and children. From novelty, as I am the first female dentist that ever practiced in the city, and some merit I hope, for the honor of your instruction, my success in every respect, has by far exceeded the utmost stretch of my imagination. My hands and arms gain daily in strength and skillful expertness in the use of my instruments for the adaptation of material for the preservation of natural, and supply of artificial, teeth. I have already two female students, or apprentices, of good families, and shall soon require the services of a third. But with all the pleasure that attends success, I cannot forget the ideal refinement of a home vocation, which is the heaven of hope to a pure women. As you advised, I have cultivated a dignified, but kindly disposed reticence, upon all subjects foreign to my profession, during "office hours" (how odd the term sounds!) but have formed some acquaintances which when tested, may eventuate in friendship. The people are kindly disposed, but, according to our standard, lack delicacy and refinement. Visiting the Princess C——a few evenings ago, her husband, first in joke, but afterwards in earnest, tried to induce me to receive him as a patient, and I anticipate, from his manner of treating my met hod o frefusal, future annoyance from others. *

You question the cause of the Russians' intolerance of the Jews; and seem to have had your sympathies aroused in their favor, as if they were blameless of provocation. But from what I have seen of them, I do not feel disposed to discredit the reports which charge them with acts that would put to shame those of their father Abraham, when he took his wife Sarah to Egypt and bartered her for service to the King of Gerar and others, under the pretence that she was his sister or daughter.

The Russians, or Sclaves, are not over-scrupulous in taxing self-restraint for the preservation of virtue; but it appears that even with them there is a limit to shameless prostitution that will barter the purity of daughters for a price in gold. All seem to rejoice in their forced exile, and wonder that the puritans of Yankee-land should receive them with sympathy. * * * * * I have discovered that the natural preference of Russia women is for male dentists, and the husbands *vice versa*, a choice that I am afraid will mar the prospects of female dental operators of my predilections throughout the civilized world; but I hope the novelty will last long enought to purchase my selfish desire for liberty. * * * There is one harbinger of good omen that promises a happy recompense for the minor evils of my exile; in visiting associations the conversation is often abruptly turned from general topics into a semi-philosophic discussion of the influences which most tend to enoble and elevate society, in the scale of mutual confidence and sympathy. Of course, with natural egotism peculiar to the sex, it was generally conceded that the cultivated womans' refinement and sincerity were influences absolutely necessary for the accomplishment of any good purpose; and as Prince C———,aptly remarked, the predenominating lack of those qualities gave the direct negative of brutality, which in reaction recoiled upon woman—as the conservative medium of example—with a downward power for her debasement; an illustration he cited the elevating influence of the English womans' dignified sincerity upon the natural characteristics, and in contrast from the opposite cause, German boorishness and vulgarity. This, and incidents of like import, afford me the tacid assurance óf a gratifying appreciation, derived from exampled impression; and as it is the hope of my heart, I have no fear, as I am certain it will increase in power of expression from an approval that intimates the desire of adoption. * * * * * *

If all the females who select the profession of dentistry as the means of gaining a livelihood, from natural choice or that of necessity, should possess the quick perception and natural ability indicated in the above letter, we might hope that the influence of their exertions would tend to the discovery of a dental laboratory within themselves, which might, judicious co-operation on the part of male dentists, be made to reproduce natural sets of teeth without blemish, possessed of constituent materials derived from a healthy source, that would insure uniformity and life-long endurance. For the consummation of a result so desirable, it will, of course, be necessary to make the conceptive public *feel* that the transgression of nature's laws brings immediate suffering to the transgressor; as selfish gratification has become so predominant in democratic expression, a father of the herd, would scarcely abate a drink, cigar, or quid of tobacco to save his prospective child from the misery which their use, and like vitiated habits, are certain to entail. There was a time within the historical period of memories recollection, when the women of the United, states, without exception, would have esteemed it an insult for a man with a cigar or pipe in his mouth to offer his company to them on the street; at that period, the necessity for the service of a dentist was in so little demand his professional existence was confined to large cities. Until the introduction of lager beer and votaries to its corner grocery chapel of dispensation, whose ancestors had for centuries, in transmission, been inured to its degrading and stupefying effects, which from incorporation they consider a constituent part of themselves and entitled to citizenship, the teeth of the native Americans in regularity and freedom from decay bore testimony to the healthy simplicity of their habits. Colonization may be effected in a variety of ways, quite as repugnant to our natural feelings of honor and justice as when enforced by direct usurpation; and an undiscriminating toleration of emigrants, who bring with them habits of debasement sure to prove contagious and destructive to all the elements of kindly affection and refinement in association, as well as to the rational preservation of physical integrity, should at least be held in quarantine from citizenship, as examples of reproof, until they had given practical demonstration of a disposition to adapt themselves to the healthy regime of the country. The chlora and small-pox create alarm from epidemic invasion, but when the hitherto mysterious cause is removed, they leave in renewal a healthy impression; but the lager beer sot, and users of tobacco, are chronic examples of leprous habits, who deny the same in disposition nature's privilege of a atmosphere, and by breeding contagion, colonize its source, and deprive the well disposed of sustenance designed for the normal development of mind and body.

Apsorptive Preservation of Decayed Teeth may be effected by cotton or Chinese rice paper, frequently renewed in the cavity, without antiseptic addition, other than that peculiar to the retentive material and fluids of the glands. Numerous instances are cited—with proof authentication—in which exposed pulp had been treated by this simple method,—through fear from dental experience,—and preserved without pain, but with evident improvement in structural condition, for noted periods exceeding twenty years, the recuperative power of the pulps having supplied a substitute for, if not identical with, the original elements of dentine. As density adds to the conductive power of any material, the impaction should be regulated according to the sensitiveness of the exposed dentine and pulp; at first, the pressure should be just sufficient for the retention of the pledget, and if cautiously introduced, will, in a majority of cases, abate pain and absorb decayed matter from the inner surface of the cavity, as well as the food source of irritation from without. As timid persons usually prefer to trust to their own sense of feeling in the adjustment of remedial substances, a little instruction will enable them to accomplish it effectually; and dentists of clear judgment and long experience claim that the adoption of this method, is more satisfactory, in favorable cavities, for relieving pain and preparing the exposed dentine for contact with filling, than the free use of narcotico, as in reaction they often become irritants, and by causing expansion, make it necessary to remove the "plug" to prevent ulceration and alveolar abscess.

It has been clearly established by test observation and comparison, that diseased dentine which has been treated by the various obtunding preparations used by the dentist, and water for washing out the cavity, retains the moisture for months after extraction, while in those extracted without treatment the evaporation is much more rapid. As a natural sequence to cause and counter effect, engine-welded gold admits of no absorptive reaction, and, but for the inevitable space from the shrinkage of the dentine, after the irritation has subsided, few would escape the penalty of ulceration. Another effect that especially tends to weaken the cohesive tenacity of both cementum and enamel, is their deprivation of the peculiar vitality supplied from the dentine, by the unyielding pressure of the welded gold at the junction of each with the other, producing strangulation that prevents its transmission, causing them to crumble from attrition in mastication. The impression generally prevails that the absorptive tendency is from the mouth inward, but the contrary may be proved by testing the outer and inner surface of a filling, or pledged of cotton which has been for sometimes retained in the cavity of a tooth, as the latter, if closely impacted, will be found comparatively dry where it came in contact with the walls of the cavity, the glairy penetration of the saliva showing distinct traces of demarcation, but a few lines in depth from the surface.—*Dental Practitioner.*

ARTICLE II.

MICRO-ORGANISMS AND DENTAL CARIES.

BY DR. W. D. MILLER, BERLIN.

In an address delivered before the Odontological Society of Great Britain, on the 5th of April, 1884*, Messrs. Underwood and Milles presented some views relating to the "Influence of Micro-Organisms in the Production of Caries," which, if established, would tend to show some inaccuracies in the published results of my experiments.

In the first place Messrs. Underwood & Milles failed to produce artificial caries, and in their opinion, as well as in that of others then present, the production of artificial caries is an impossibility.

Inasmuch, however, as I have on various occasions demonstrated preparations of artificial caries here at the Physiological Institute, and to various well-known microscopists in private, the possibility of the production of artificial caries is a fact which does not admit of discussion.

Not alone the softening of the dentine, but the invasion of the micro-organisms, extension of the tubules, breaking down of the basis-substance, melting together of adjacent tubules, the production of round and oval spaces or caverns in the dentine, and lastly, the total disappearance of the

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*See *Dental Record* page 225.

dentine—all these may be exactly reproduced by artificial decay.

I shall demonstrate a large number of these preparations at Vevey on the 26th of August next, including the tubules which are shown in the *Independent Practitioner* for May, I can only say to all who doubt the possibility of artificial caries—Come and see. Messrs. Underwood & Milles failed to produce caries for very evident reasons, and, as it happens, those reasons I have given in a paper written three months ago, and published in the May number of the *Independent Practitioner* and in the *Dental Record*, p. 158, etc. In the description of this attempt to repeat my experiments, Messrs. Underwood & Milles say: "The bottle not containing carbolic speedily became the scene of an active growth of micro-organisms, for the greater part micrococci; *a thick felt of this growth formed at the surface of the fluid*.

I have up to the present time isolated five different species of fungi from carious dentine, one of which, from the constancy with which it occurs, may I think, be regarded as a chief factor in caries. Neither this nor any other micro-organism thus far isolated ever forms, in pure cultures, a film upon the surface of the liquid. I am familiar with a felt such as described by Messrs Underwood & Milles; it is not a schizomycete but a blastomycete; it has nothing to do with caries, and, as I stated in the *Independent Practitioner*, when it appears in the culture, the latter may as well be thrown away at once. *I have never succeeded in producing caries where this thick felt was present;* nor could I expect to under such abnormal conditions.

Messrs. Underwood & Milles do not state definitely what the felt consisted of in their case. I should, however, be very much surprised if it were not identical with mine; it was, at any rate, something, which does not and could not well occur in the mouth, and did not occur in the experiments in which I succeeded in producing caries. This experiment, therefore, cannot be accepted as a repetition of mine. Messrs. Underwood & Milles state on page 239* that "the presence of a number of extraneous organisms does in some cases hinder the active growth of others." Perhaps it was this very felt present in their experiments, but not in mine, nor in the mouth, which accounts for their failure. Another great source of error in these experiments lies in the fact that the fungi themselves are rendered inactive by the acid which they have produced; we obtain, consequently, softening of the dentine, but no invasion of fungi. For a full description of this case and the methods employed to avoid, I must refer to the columns of the *Independent Practitioner*.† Within a tooth the enormous extent of surface exposed by the lime salts to the acid prevents its ever becoming so strong as in our cultures.

Again, in the experiments described on pages 235-6 they failed to produce caries, "the putridity of the baths being so offensive" that they abandoned this experiment with relief.

I must confess to not a little surprise that the gentleman should have kept up the experiment at all, for they say themselves (page 251), and I heartily endorse the statement, "we all agree that without some weakening of the enamel by acid nothing in the shape of caries could go on at all," and yet they wasted six months of valuable time in the vain attempt to produce caries in putrid baths which had an alkaline reaction. I have time and again called attention to an experiment which I began may 19th, 1882, over two years ago, in which pieces of dentine have been kept constantly in contact with putrefying substances richly infected from the mouth. Up to the present not a trace of caries or even softening of the sharp points has occurred, although microscopic sections show that here and there a coccus has worked its way into a tubule, which, of course, it might do if the walls of the tubule were of glass—that is no indication of caries.

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*Transactions of Odontological Society.

†See also *Dental Record* for March, April and May.

It is a fact which I have had abundant opportunity to test, and which every dentist can test for himself, that if we take a freshly extracted *decaying* tooth with pulp intact, thoroughly clean the root from pus, or whatever might produce an odor of putrefaction, remove the *debris* from the cavity, as well as the outer layers of most decomposed dentine and what remains, the truly decaying dentine will have a pure sour smell, never a putrid one. Furthermore, I have during the last six months had constantly in my laboratory from 10-50 cultures of different caries fungi in malt, beef extract, sterilized saliva, calves' broth, blood serum, etc., and have in no case, in pure cultures, observed anything offensive or putrid; especially where sugar is present we always have a thoroughly pure sour, not at all disagreeable smell. It is not strange, then, that no caries occurred in those offensive putrid baths.

Messrs. Underwood and Milles' experiment confirms what I have written in the *Independent Practitioner* for 1883, that the fungi cannot attack sound teeth till they have been acted upon by acids. That this acid is produced largely by the organisms themselves will, I think, be found clearly established in the same journal for February, 1884.

It does not matter how "dirty-mouthed" a man may be, or how much putrefaction may be going on in the oral cavity, that won't produce caries—in fact, the alkaline products of the putrefaction may arrest caries by neutralizing such acid agents as would give rise to it. It is only when the condition is such that the action of the micro-organisms is accompanied by the production of acid and a pure sour smell that caries can be produced.

Mr. Milles (page 241) describes a third attempt to produce caries, but here so important a factor is left out, and the solution used so abnormal, that we would be obliged to predict a failure in the very beginning.

I described at Ostende (1882) a series of experiments showing that fungi taken from carious dentine could not produce softening or decalcification of sound dentine, even when presented to them in the form of powder. In those experiments, however, I made the same mistake that Messrs. Milles & Underwood made in their later attempts to produce caries, viz., I put them under such abnormal conditions that they could not produce the acid necessary to decay.

In the human mouth we have sugar almost always, if not always, present, either taken into the mouth as such, or produced there by the action of the ptyaline of the saliva upon starch.

The fungus, which I consider to be the chief parasitic factor in caries, since I have never failed to find it in carious dentine as well as in saliva, while it has but a slight diastatic action, if any at all, has the power of splitting fermentable sugars, *i. e.*, of converting them into fermentaable varieties. These take place of the simple formulæ:—

$$\underset{\text{Cane Sugar}}{C_{12}H_{22}O_{11}} + H_2O = \underset{\text{Dextrose}}{C_6H_{12}O_6} + \underset{\text{Levulose}}{C_6H_{12}O_6}$$

$$\underset{\text{Fermentable Sugar}}{C_6H_{12}O_6} = \underset{\text{Lactic Acid}}{2\,C_3H_6O_3}$$

We see, consequently, the vast roll played in the mouth by starch and sugar, and in our cultures the latter, at least, should never be omitted, since without it we will obtain but a slight production of acid, and, in most cases, none at all, and without acid we labor in vain to produce caries.

If Messrs. Milles & Underwood had added a little sugar to the blood serum the result would had been different; even then, however the whole difficulty is not overcome. The solution soon becomes so acid as to render the organisms completely inactive, and in liquid media they lie as a sediment on the bottom of the vessel.

I have sought to remedy this by adding pulverized dentine, and, frequently renewing the solution, I can produce softening of the dentine and penetration and expansion of the tubules in three weeks. I do not believe that this can be done in a stinking solution in three years—no, nor in 300 years. Mr. Tomes attributes the failure to produce caries to a lack of oxygen. It is probable, however, that in flask experiments the fungi obtain more oxygen than in the deeper parts of carious dentine. I have shown, moreover (in the *Independent Practitioner* for February, 1884) that these fungi may be successfully cultivated under oil or in flasks, where the atmospheric pressure is only 1–100 the normal, or in flasks which have been deprived of oxygen by an alkaline solution of pyrogallic acid.

In discussing the question of the genetic connection of the different micro-organisms of caries I briefly say that I have never stated that all the micro-organisms found in carious teeth are forms of one fungus; far from it; but that there is one fungus found in the human teeth which produces cocci, bacteria, bacilla, and leptothrix, and that all these forms may be found in concoction.

As stated above, I have, in the last three months, by means of the gelatine culture, isolated four other varieties. I did not suppose that this question would receive any attention from the dental profession; it is, however, a subject which has excited a vast amount of discussion in Germany.

When, therefore, I published an account of this fungus in "Kleb's Archive, 1882," I did so with a full understanding of the question at issue. My preparations were twice demonstrated at the Physiological Institute, and to a great many mykologists in private. Dr. Eidam, of Breslau, assistant of Prof. Cohn, visited me in Berlin, and, after examining my preparations, remarked: "Ya es ist gerade wie sie es beschrieben haben" (Yes, it is exactly as you have described it.) I can also show tubules of carious dentine containing micrococci in one end, bacteria in the middle, and bacilli in the other end, not by any means in all preparations, but in some. There is nothing peculiar in this case: many fungi are known which produce forms morphologically different. At the late Congress of the "Verein fuer Innere Medicin," preparations of the micro-organisms of pneumonia were demonstrated in which cocci were seen united to bacilli. I repeat, therefore, here, the statement made in the *Dental Cosmos*, 1883; "We may have before us a case in which one fungus can produce entirely different forms of development." Although I have already so often demonstrated this fungus I will be ready again to demonstrate it at Vevey to any one who should care to see it.

We come now to the zone of softened dentine. A discussion of this question seems almost unnecessary, since on page 231, Messrs. Underwood & Milles grant the only point for which I have contended when they say: "We do not deny that there is a great probability that the advance guard of micro-organisms may be surrounded, and, to a microscopic extent, only preceded by a softening, the result of the action of these acids, which they themselves produce." That is all I ask for. My object has been always to show the absurdity of the statements of that American school of *non*-investigators who maintain that the organic matter is first devoured by the micro-organisms, thus setting free the lime salts which are *subsequently* washed out mechanically.

I have shown by chemical analyses, which have nothing to fear from repetition, that in a large piece of carious dentine 12–13 of the lime salts were gone, and only 2–5 of the organic matter, thus proving that the decalcification was far in advance of the destruction of the organic matter; that is the point that I wished to establish, and I do not believe that Mr. Underwood differs from me there. Nevertheless, the zone of softened noninfected dentine is a thing which admits of easy demonstration in many preparations.

Some fifteen months ago I sent a number of such prepations to America, which passed freely around from city to city, and were carefully examined by a large number of microscopists. Not one of them, either for or against my views, ever denied the existence of the zone of softened dentine. One of those who have been most opposed to my views, writes: (*New England Journal*, p. 350) "There seems in many cases, at least, a territory of dentine between the portion that is absolutely healthy and the territory where the micro-organisms abound, that is *changed* somewhat, but not absolutely infected." He even attempts to account for this zone by the supposition that the micro-organisms absorb the protoplasm from the fibrils in advance of themselves, thus bringing about the change seen in Dr. Miller's specimens. However absurd the explanation may be, it shows that he recognizes the zone.

Dr. Ross, of Chicapee, writes me that he finds it with ease. Dr. Boynton (*New England Journal*, p. 133) also recognizes it. For my own part I have such an abundance of preparations showing it, that it would be difficult for any one to persuade me that it has no existence. It is when the caries is advancing at right angles to the dentinal tubules that it is particularly pronounced. Take a molar tooth with a medium sized aperature on the grinding surface, from which the caries has extended in all directions under the enamel, break away the walls of the enamel and then with a spoon-shaped excavator be sure that you scoop out all the carious dentine in one piece, cut on the freezing microtome, stain in Fuchsine, and in almost every case large tracts of carious dentine will be found on the sides that are free from organisms. Where the decay is advancing parallel with the tubules, the micro-organisms follow hard upon the softening which they themselves produce; in some cases a few stragglers even may get over the border. At the same time we will often find, even here, not a regular even zone, but large tracts of softened dentine free from organisms.

Messrs. Underwood & Milles' method of testing this question (page 249), is so difficult of carrying out as to render it absolutely impossible. Suppose we have a large cavity containing, say a layer of infected dentine 2 mm. thick, succeeded by a layer of softened, non-infected dentine 1-10 to ¼ mm. thick. Now, if I were compelled on penalty of death to remove all the infected dentine, and to obtain from beneath a piece of the softened, non-infected dentine, without impurifying it by a single coccus from the overlying layers, I could not do it, nor do I believe that any mortal man can do it. I shall be prepared at Vevey to demonstrate these zones, or areas, of softened non-infected dentine on over 300 specimens: there existence is an absolute certainty. I shall there be prepared to cut and mount specimens from large pieces of carious dentine in the presence of the members, and demonstrate the areas cf softened dentine on the same.

I believe, however, that here the difference between us is only imaginary. I hold simply that the fungi cannot attack sound teeth, until they have undergone a certain softening by acids; in other words the decalcification precedes the direct action of the fungi themselves; and if Messrs. Underwood & Milles are of the same opinion, as I judge they are, then there is no occasion to lose so much time in the dispute.

I wish to refer still to the remarks made by Mr. Coleman relative to the change produced in the teeth by exanthemata. This change, as I have frequently pointed out in the American journals, I consider to be entirely independent of micro-organisms; on the other hand it must be sought for in the chemical nature and the nutritive function of the tooth itself.

Why is it that a tooth is so much less soluble in acid, than an equal sized lump of tartar? or why if we mix together the separate constituents of the tooth in the same proportion as they exist in the teeth, do we find the resultant mass so much more soluble than a tooth? The answer is that in the teeth the lime salts form with the organic matter a definite chemical combination, which compared with the lime salts themselves is much more insoluble.

Now this combination we cannot bring about by simply mixing the constituents together; it is a result of the vital force in the tooth itself, and this same vital force which produced the combination can, and, as it seems, does under certain conditions of ill-health dissolve it again, thus rendering the tooth more analogous to a simple mixture of lime salts with organic matter, and of course more easily soluble for acids.

This combination may be stable or unstable; in the former case the teeth are hard, shining, transparent; in the latter they are soft, chalky and opaque. It may at one time be stable, and as the result of some change in the vital or nutritive activity of the tooth, become unstable.

The resistance which a tooth offers to decay will therefore depend, to a certain degree, especially in youth, upon the health of the patient. In old age changes take place much less rapidly in the teeth than in youth, and as a consequence old teeth are not so subject to what we may call spontaneous caries as young teeth. Neither should pulpless teeth be exposed to it, and here is a chance to put this theory to a test. I do not offer the above as the result of experiment, but simply as something which appears to me to offer a possible solution of the question stated.

The fact that micro-organisms play an important part in the production of caries will at present be disputed by very few. It is a point insisted on by many earlier investigators on the subject, by Lelér and Rottenstein, by Weil, and many others.

Messrs. Underwood & Milles and myself cannot claim to have done anything more than to have confirmed the views of those investigators, and perhaps to have placed the matter upon a more scientific basis.—*London Dental Record.*

ARTICLE III.

REPAIRING VULCANITE PLATES.

BY GEORGE B. SNOW, D. D. S., BUFFALO, N. Y.

The recent patent for a method of refitting vulcanite plates, which was published and commented on in the April *Advertiser*, has brought up a question as to what is extant in the text-books upon Mechanical Dentistry concerning this matter. The directions for repairing and refitting this style of work will be found very meagre, and it is believed that something can be written upon the subject which will be acceptable to at least the new beginners in dental practice.

It is not unusual to see vulcanite plates which have been cracked or broken, and repaired by what may be termed the "hole and plaster" system. Holes are drilled through the plate along the edges of the crack, and a new thickness of rubber superimposed upon a mass which possibly is already too thick for comfort or convenience ; the old crack still remaining as a weak point to occasion further breakage. No advantage was taken of any possibility of union between the old and new material, the dentist having been obviously ignorant of the fact that perfect union can be obtained in such cases if the surfaces of contrast are freshly cut, absolutely clean, and properly roughened.

The fact that such bungling work is not uncommon must be the apology for a treatment of the subject more extensive in its scope than was originally intended, and a paper which cannot but be an only story to many readers.

The great point to be remembered in repairing or making any addition to a vulcanite plate is, that the new and old material will unite perfectly, and with such firm adhesion that the plate will be practically as good as new, if the surfaces of the old plate where union with the new material is desired are freshly filed, *absolutely clean*, properly roughened, and of sufficient area. To insure these results, wax should not be melted upon the surfaces of union in waxing up, and removal of the wax from the mould should be accomplished by means of instruments, and not by hot water, unless, possibly, for the removal of very small particles which cannot otherwise be got rid of. Any amount of the old material desired my be cut away, and its place supplied by new ; and thus any change wished may be effected. In case of breakage or cracking, the plate should be cut away so that the old defects will be wholly obliterated and new material supplied.

As a first instance, suppose a partial lower plate, supplying the loss of the bicuspids and molars on both sides of the mouth, to be broken through the bar which extends from one side of the mouth to the other behind the incisors. The fracture is generally a clean one, resembling that of a glass or porcelain, and the two pieces may be brought into opposition with certainty. The dentist holding the parts together in exactly the right position, the assistant covers the lingual side of the plate at the point of fracture with a few drops of hot shellac from a shellac stick. A little cold water follows, and the two parts of the plate are firmly cemented together. A brace is now extended across from the molars on one side to those on the other, by laying a burnt match on the grinding surfaces of the respective teeth, and fastening both ends with a few drops of hot wax. By this means, sufficient strength is obtained to allow of the plate being safely handled. A piece of paper or sheet wax is cut to fit and reach across the lingual space at the lower edge of the plate and fastened therein with wax, a coat of shellac varnish is applied to the paper, the surface lathered with soap-suds, and rinsed, and a model run in the same manner as in filling an impression.

After this has hardened, the plate is removed from the model, which is then given a coating of liquid silex. This is always preferably done in repairing plates, at the time when the plate is first removed from the model. The bar may now be wholly cut away close to the body of the plate on either side by a jewellers' saw; the cut being made diagonally, so as to make what is termed a "scarf" joint. The surfaces should be further roughened by making a series of shallow parallel cuts across them with the saw, a thick separating file, or a thin wheel engine bur. The parts of the plate are placed upon the model, waxed up, and flasked; the model and buccal surfaces of the teeth being covered with plaster, and the parting made so that the plate will be retained upon the model, while the pieces of the bar can be readily removed. After the flask is opened, the pieces are removed, the usual gateways cut, and the packing, vulcanizing and finishing done as usual.

In the case of an entire lower set broken through the centre, it will be seen that the same directions will apply, excepting as to the amount of rubber to be cut away. A free cut should be made on the lingual side, extending through under the teeth, to and including the labial band; so that the broken surfaces will be entirely obliterated and at least one-eighth inch in width of new rubber supplied between the cut surfaces. An engine bur will do much of this work nicely, and a wheel bur is very convenient for the purpose of scoring the surface. The making a model, flasking, and packing will be done as before.

If one of the incisor blocks be broken, and needs replacement, a new one can be fitted after the model is obtained, and the remaining steps of the process followed as has been described.

Upper plates are sometimes cracked in the centre, the crack extending from under and between the incisor teeth backwards over the palate. This often happens from the amount of rubber just behind the incisors being insufficient. Is it not unusual to see it cut away at this point so that the pins are almost or quite exposed; the plate plate having its usual thickness at a very short distance behind the teeth. A much larger amount of material will be tolerated here than is usually employed, and often with benefit, not only to the strength of the plate, but to the articulation of the wearer. The curve of the surface of the plate should be made to resemble that of the palate before the removal of the teeth, and it will be found that the extra thickness that may extend for half an inch behind the teeth without annoyance to the patient.

A proper curvature to the surface of the plate, just behind the incisors, will do much to prevent the disagreeable whistling in making the *s* sound, and will assist in giving the correct enunciation to *sh*, *zh*, and other linguals.

If the cracked plate fits a flat mouth, a model can often be drawn from it as it is; but if the arch is high, and the gums projecting, it is better, after thoroughly cleansing and drying the plate, to finish the cracking by breaking the plate entirely in two. The two halves may now be fastened together by dropping shellac upon the lingual side, and a model secured, from which either half of the plate can be easily removed. The whole palatal portion of the plate can then be removed by a saw cut, leaving only a narrow margin on the lingual surface inside the teeth. The remainder of the surfaces of fracture are cut away as directed in case of the lower plate, the new surfaces roughened, the pieces of the old plate replaced upon the model (which has received its coating of liquid silex), waxed up, flasked, packed, and vulcanized, the teeth being retained upon the model as before described. The plate, when finished, will show the old rim and a margin of the old rubber inside the teeth.

It is sometimes desirable to change the substance of the plate entirely, as in case of supposed mercurial poisoning by red rubber; or at least to put what red rubber there may be about the plate entirely out of sight, and to reduce its quantity to a minimum. If this is to be done to the plate last under consideration, it should be prepared for flasking as described, excepting that the labial band should be cut away, and everything arranged so that the plate can be separated from the model when flasked. The parts cut away should, of course, be replaced by wax. The case is now set in the flask so as to leave the parting at the upper edges of the gums. The plaster is varnished and oiled, so that the appearance will now be precisely similar to a plate flasked so as to be retained upon the model. The ring of the flask is now put in place and filled, and the plaster allowed to harden.

When the flask is separated, the teeth will be found in its ring section. A few blows of the hammer will dislodge them, with the piece of plaster built against their labial surfaces. This is carefully broken away, in two pieces if possible which are preserved, and the teeth and rubber encasing them is left. The rubber is now filed away as much as practicable, leaving none of the old rubber in sight, and removing enough from the palatal surface to make a new fit to the model. The teeth and plaster are replaced in the flask, and the case is ready for packing and vulcanizing, and, when finished, none of the old rubber will be seen, and the plate will be practically as good as though the teeth had been removed from the old plate and reset.

It is sometimes difficult to prevent the rubber from showing at the joint between the incisors; great care should be exercised in bringing the sections together properly and in holding them in position while flasking. If there is room, a small wisp of loose cotton, not larger than a thread, may be tucked into the joint on its palatal side, the edges of the blocks being bevelled to admit of this being done.

It is evident that the change from red to black rubber just described can be made with a whole plate or a broken one indifferently. If a change of articulation and a new fit to the mouth is also desired, on account of shrinkage of the gums, the plate should be prepared so as to draw from the model, and a few small pieces of wax put in the palatal side to bear upon the alveolar ridge and give the right articulation by trial in the mouth: the centre of the plate being cut away to facilitate the fitting of the plate to the model. A fresh model of the mouth being secured from an impression, the plate is waxed on to it, the case is flasked with a false piece of plaster built against the labial sides of the teeth, as has been before described, and the plate afterwards removed and cut away as much as desired; a considerable amount being always taken from its palatal surface.

This process does all and more than is specified in the Hyatt patent, as it not only gives a new fit, but allows the material of the plate to be substantially changed. Holes and dovetails, it will be seen, are wholly unnecessary, and the fine serrated edge left by cross-cutting the surfaces of union will be found an excellent guide in scraping the plate to avoid overlaps. The use of shellac as a cement is strongly advised in repairing, as it is rigid and brittle when cold, and the broken parts, if once properly brought together, cannot get out of adjustment without at once attracting attention by the breakage of the cement. Wax does not answer the purpose nearly so well.

The amount of shrinkage in vulcanite from cooling after vulcanization is not so generally noticed and provided for as it should be. Plates composed of single teeth do not give trouble from this cause, but full plates, on which sections are mounted, are often very vexatious to the dentist from the change of shape they undergo from shrinkage.

The reason of this is, that the ends of the sections abutting from an arch of porcelain, which expands or contracts but slightly from changes of temperature. The rib of vulcanite immediately inside this arch, and in which the pins are embedded, forms a second arch closely attached by the pins to the first one. The plate is moulded to the model, and hardened at a temperature of about 320°, and is afterwards placed in the mouth, where the temperature is in the neighborhood of 90°. Under these circumstances the contraction of the rubber which ensues has the effect of lessening the radius of the arch, drawing the heels of the plate together, thus rendering it a little narrow to fit the mouth accurrately. This has the further effect of elevating the palatal portion of the plate, which, when tried in the mouth, will usually be found to rock slightly; often so much as to interfere with its fitting.

If the plate has been made upon a model taken from the mouth, the difficulty is overcome by warming the back part of its palatal portion, pressing it down slightly, and cooling it while the pressure is continued; the narrowing of the plate being too small in amount to be of itself objectionable.

This change can be accomplished with more certainty by making a small plaster cast of the palatal portion of the plate, placing upon the part where the change is desired a small piece of folded paper, and forcing the plate down upon it after its palatal portion has been warmed.

The shrinkage here alluded to becomes a more serious matter when the plate is revulcanized in the course of repairing it. It is flasked when the change in form by its shrinkage has already once manifested itself, and again heated at 320° ; and in cooling a second shringage takes place, it becomes still narrower, and its fit, already defective, is made perceptibly worse. It now becomes a matter of necessity to bring it back to its proper shape before it can be worn with comfort. To provide for this, a small dot should be made with a pointed instrument on each side of the plate immediately behind the molars, and a pair of dividers set to the distance between these points. After vulcanization, the dividers can be applied to the marks, and they will indicate the amount of shrinkage the plate has experienced. Let the plate now be warmed just behind the incisors, and in the mesial line, by repeated short puffs of a blow-pipe flame. This must be done carefully, and the heat not allowed to extend over an area much exceeding half an inch in diameter. When the rubber is sufficiently softened, the plate should be taken by the heels, a pull made upon it sufficiently forcible to expand the arch, and a stream of cold water applied. The dividers will at once show if the change made is sufficient.

When the plate is now tried in the mouth, it may be that the back edge will not touch the roof, and air will be admitted under the plate; in which case the back edge should be warmed and forced up to its proper position.

The same remarks apply to full lower plates as well, which often are found to have lost their fit in a measure, after having been revulcanized. The process above detailed will suffice to restore them to their former fit, and render them again comfortable to the wearer.—*Dental Advertiser.*

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368 MADISON AVE., BALTIMORE, *July 25th*, 1884.

MR. EDITOR:—The Edition of the *Dental Advertiser* for July doubts my statenent respecting (dovetaily and undercuts in Vulcanite rubber being tought in schools or Dental Works on Mechanism.

As I am a stranger in this part of the world I can only refer him to Charles James Fox, the present Editor and Walter Blundell, the first Editor of *British Journal of Dental Science*, England, for both of whom I did work as described in 1862, and was noted in Journals about that time, and as we are upon the subject of instruction in Mechanical Dentistry and matters bearing thereon, may I ask how is it that a patent has been granted within the last year for (bleaching rubber plates by exposure to solar light in alcohol) to an American dentist when Ash, of London have published the process in their catalogue as long as dental rubbers have been in use, and which should be taught in every dental laboratory.

The dentist making oath that he is the original inventor of the process must have taken advantage of the *omission* on the part of (Editors authors and professors on this side of the Atlantic to instruct the students in some of the older methods of Dental Mechanism but which are still considered important enough to take a patent upon.

Some dovetail work was shown by me at the Deer Park Convention, and at Philadelphia on a former visit in 1877, and among other things I brought over for inspection was *articulating* paper which I see announced in this months *Cosmos* as patented here, but which is the old form of manifold writing employed by drapers in England, and prepaired expressly for dental use by Field, of London, under a patent of Mr. Barkley, of same place. Sold at 50c. a dozen, but pirated on this side and retailed at $1.00

If the Society that Dr. Catching, of Atlanta, is trying to form once gets started it will be a great gain to the profession.

The idea is that it should be a truely National one, with a Museum at Washington, containing the records of every known appliance in dentistry with model or drawing of same, preparations of materials used in past and present library and books on dentistry to be collected from all parts of this country and abroad, and a periodical record sent in from every State Dental Society, which together would be of vast importance to the examiners at the Patent Office, and protect the profession from——that wholesale filching of property which so often occurs, caused no doubt by the vast distances that may intervene between the original inventor who may only be a visitor here, or show his design at some convention, and the unscrupulous person thát may chance to see or hear of it from the reports in our journals and which do not find their way to the Patent Office at Washington.

D. GENESE.

EDITORIAL, ETC.

STOMATOSCOPES.—For several years past instruments known as stomatoscopes, intended for illuminating the mouth, especially in cloudy weather and evenings, have been employed and highly recommended by many prominent dentists. The electric light has also been utilized for the same purpose, and also for examinations of the throat, and even of the stomach.

Mr. E. T. Starr, of the S. S. White Dental Manufacturing Company, has quite recently perfected an apparatus concerning which the Philadelphia *Press* speaks as follows:

One of the newest adaptations of electric illumination is in the shape of a very small lantern, which can be introduced into the mouth, throat and (in some cases) the stomach, for the purpose of aiding surgical and dental operations which cannot be carried on without light, and for which it has been extremely difficult heretofore to obtain light by mirrors or other means. Experiments have been making for some years to perfect an apparatus of this kind. Since 1881, E. T. Starr, an expert in electrical science, has been working at intervals upon minute electrical lamps in his rooms, in White's dental establishment, at Twelfth and Chestnut Streets, and at last has succeeded in getting highly satisfactory results. Patents have been obtained. The instrument has been critically examined by dentists and surgeons, and has already been used in practice.

The lamp primarily consists of a delicate glass bulb, from which the air has been withdrawn and as nearly a perfect vacuum created as possible. The bulb varies in shape, being spheroidal, flat and compass-shaped, and also cylindrical, with a conical termination. Through the thin walls of the lantern run the conducting wires, connected by a carbon arc, on which the electricity centers, and which thus becomes the place of light. The glass lantern is very small; the cylindrical-shaped being scarcely half an inch in length and with a diameter not nearly so great as that of an ordinary lead pencil. The compass-shaped lamp is about one quarter of an inch thick and has a diameter of three-quarters of an inch to an inch, while the spheroidal seems scarcely larger than a good-sized pea. The lamp is attached to a handle from seven to nine inches long and about half an inch thick, through which run the wires connecting the battery. The handle on the lamp can be separated, and thus but one handle is necessary for use with the different forms of the lamps. The intensity of the power, and hence the brilliancy of the arc of light, can be regulated by moving along the handle a ring which connects with the wires. The handle has several joints, and its position can be arranged in almost any way so as to adapt it to the shape of the cavity which it is proposed to illuminate. Mirrors can also be fastened to the lamp and light reflected to places where the lamp cannot be introduced. To prevent the too great diffusion of light and the radiation of heat, the lamp may be partially covered with a hard rubber or gutta-percha case.

When the lamp is placed in the mouth of a patient every portion of the throat, even to the lowest parts, and every recess of the upper places can be plainly seen. This will greatly facilitate the work of surgery and dentistry, and enable an operator to conceive a much more thorongh diagnosis of a case than the use of any other means previonsly known. Placed behind the teeth, the intense light renders not only the teeth, but even the gums above, highly transparent. If the teeth are good and undecayed, no lines will be visible; but the presence of a filling or of the mere beginning of decay may at once be seen. When the lamp is placed within the mouth and the lips are closed, the entire front structure of the mouth is brought to view. The bone and tooth formations are easily discoverable, and even the interior of the nasal passages. In the same way the instrument is of great value in the treatment of obstetrical disease, and in studies of the stomach. No unpleasant sensations are experienced by patients, even in cases of protracted use, no other effect being noticeable than that which follows the drinking of a hot cup of coffee.

The difficulties in bringing this application of the electric light to practical use were due principally to the fact that none of the electric manufacturing companies in America could make the right kind of a lamp. Mr. Starr tried them all, and not getting what he wanted in the very best shape, was compelled to go to Europe. More than a score of different lamps, carbons and means of conveying power had to be tried before the best were found.

MONTHLY SUMMARY.

CLEANLINESS.—If the old adage be true that "Cleanliness is next to godliness," it is equally true that many dentists of the present day are very far away from godliness.

While it is not to be supposed that many gentlemen before me require a lecture upon refined manners and tidy habits, yet it is painfully true that many of our profession need just this very lecture upon a principle which is among the most important, if not *the most radical one of our calling*, and to which they would appear to be almost total strangers.

If the dentist does not possess sufficient means to furnish his office elegantly, he can certainly give it an air of cleanliness, and there is little excuse for allowing unsightly objects to confront and impress our patient at first sight with feelings of disgust. That this matter is not sufficiently considered by a large number of our brethren, proofs are very abundant.

There is no excuse for furniture covered with dust, carpets littered and unswept, or spittoons bespattered and unsightly with blood from a previous victim. There is no good reason why a dentist should not have a bountiful supply of clean napkins, towels and rubber dam. There is no good excuse for a dentist not thoroughly cleaning his forceps, his excavators, or his scalers and separating files. There is nothing to prevent a dentist from washing his hands and cleaning his nails before putting them in a patient's mouth. In fact, there is no reason why a dentist should not be as near perfection, in these preliminaries, as possible.

We are, to a great degree, *the educators* of our patients. If our habits are loose, our personal appearance untidy, and our operating room in a shabby and dirty state, we cannot complain if our patients are careless in their treatment of our place and its appurtenances; if our hands and face and mouth are unclean, we dare not chide them for duty neglected and unperformed. Then, also, if a dentist be particular in keeping his office and its appurtenances neat and orderly, we feel he will be particular in having his operations thoroughly performed, and such an one will be most likely to gain confidence and esteem, even among entire strangers. In personal appearance, it is not necessary that a professional man should dress like a fop; but clean linen and suitable attention to the toilet add much to personal charms.

Our patients are usually more abserving than we suppose, and sometimes notice things that reflect unfavorably upon us; hence, we need be on the alert, and see that our manners, our apparel and our office appointments are such as will bear scrutiny or defy criticism.

It was my privilege to visit the New York College of Dentistry, a short time since, and though I say it somewhat reluctantly, it is no less true, that it was about the dirtiest place and the most slovenly lot of persons I could conceive to be engaged in teaching the principles of dentistry, much less *its practice.* The demonstrators of operative dentistry, were not bad-looking individuals, but their personal appearance was decidedly against them, in my estimation. Greasy, shiny coats; linen spotted and soiled, hands grimy, and "nails with dirt enough under them in which to plant potatoes," as we used to to say when we were boys. Of course, the students, with such examples daily in their midst, were largely on the same plane with the demonstrators, and is it at all strange that, being with them from day to day in association, they should experience—perhaps unconsciously—an assimilation?

Lastly, dentists should be clean and neat for *sanitary reasons.* Many diseases can be conveyed through the agency of instruments or appliances infected therewith. Instruments used in the mouth should always be washed thoroughly, and if any doubt exists in the mind of the operator concerning the presence of any contagious malady, the instruments should be disinfected by dipping them in a mild solution of carbolic acid and water.

Brethren, facts, like mules, are oftentimes stubborn things; but it becomes us, as professional men, as professional artists, and as professional teachers, to see to it that these important points be not slighted or overlooked. There is no need of mincing matters, and calling slovenliness *a manifestation of genius*, or dirt and disorder *the evidence of a good practice.* Carelessness and filthiness need no second invitation in a busy dentist's office—*we know* something about that. They are, therefore, no good evidence of professsional fitness but, as I have attempted to prove, are often the standard by which the proficiency by a dentist is judged. Let us, then, carefully guard this avenue of our reputation, and by precept and exambe diligent advocates and supporters of the habit of cleanliness. —*By Hyman Rosa, M. D. S., Kingston, N. Y.*

A VERY LARGE SALIVARY CALCULUS REMOVED FROM A PATIENT.—Salivary calculi are not of very rare occurance. A tumor under the tongue, on one side of frænum, a dilated duct from the sub-maxillary gland full of fluid, and called ranula, might contain calcareous deposits. But rarely have we the opportunity of reporting a calculus of such magnitude as the one which I extracted from the mouth of a patient two months since. I herewith append a report of the case;

Mr. W., aged 73, consulted me for a glaucomatous trouble. During the consultation, he desired to know whether his defect of vision could be aggravated by a disease of long standing in the mouth. In inspecting this cavity, I found a large swelling under the tongue, on the right side of the frænum. It was a prominent elevation on the floor of the buccal cavity, extending from the inner face of the chin toward the root of the tongue. Its nature was apparent at a glance, for at the anterior and upper part of this large, round, fleshy mass was an opening one-fourth of an inch in diameter, through which could be seen the exposed surface of a salivary calculus. A probe passed in through this opening entered into a large cyst, the thickened and distended duct of Wharton, which was filled with a solid calcareous mass. With a scissors I slit up the cyst wall, and removed from its bed a very of water are best. Some people clean their teeth too often, some too seldom. *Clean* them before sleep and upon rising, *wash* them after meals, and if possible end the meal with a stiffish crust—is very sound advice which a German contemporary gives his readers.—*British Journal of Dental Science.*

MICROCOCCI CAUSING LOSS OF HAIR.—Without any detectable cause, and without the accompaniment of any other symptom, a male individual was attacked by alopecia, which the patient himself attributed to infection, contracted in a hair-dressing saloon. In the region of the right temporal bone was observed a circular place, 5 to 6 ctm. in diameter, perfectly bald. In its centre were noticed a few white hairs on the shiny skin, while the margin contained a zone covered by epidermis-scales. In this zone the hairs appeared broken and stunted in their growth. The least pull on a hair at once caused its falling out, the bulb always coming with it. By coloring. Dr. Sehlen, why reports this case in the *Centrbl. f. d. Mediz. Wissensch.*, 15, 1884, was enabled to prove the presence of small, round cocci, which were less than a millimetre in size, and found in large quantities surrounding the hair in the cells of the epidermis, and sprinkled between the sheaths of the roots of the hair. The author has instituted a series of cultures not yet concluded. A mild solution of corrosive sublimate (1–3000) destroyed the cocci and established the re-growth of the hair.—*Med. and Surg. Reporter.*

MECHANICAL SKILL NECESSARY TO DENTISTS.—A physician may be very skillful without any mechanical skill, though a surgeon cannot be; but a dentist must have the element which the phrenologists, whose terms are better than their theories, call "constructiveness." Every dentist should have these six things: Good ability, good manners, a pleasant address, cleanliness, tact, and a good personal appearance. He is brought into close contact with his patrons, many of whom are ladies and children. He must touch them. He must encourage them; compose them when agitated, and help them to bear protracted, or, what is worse, sudden pain. —*Exchange.*

A DANGEROUS ADULTERATION OF IODOFORM.—Dr. Biel, of St. Petersburg, calls attention to a commercial adulteration of idoform with pieric acid, whtch cannot be detected by the tests of Pharmacopœia. This mixture is not only poisonous, but is explosive when rubbed up in a mortar. It can be detected by the citron-yellow color it yields to a watery filtrate. If a solution of cyanide of potassium be added to the filtrate, no reaction will follow if iodoform be pure; but if there be a trace of picric acid present, the sloution will in the course of ten minutes become brownish red (isopurpuric acid,) and in a short time deposits an insoluble precipitate of isopurpurate of potassium —*Deutsch American.*

THE CARE OF TEETH.—In a paper read before the Hygienic Society of Berlin, Herr Miller reported the results of his endeavors to determine the nature of the ferment occurring in the mouth, to which he is disposed to attribute the setting up of caries in the teeth. He stated that he had found the ferment to exist in the saliva, and that it appeared to result from the growth of two forms of lactic acid fungi which may prove to be reducible to a single species. In comparative tests as to the agents best suited to stop the development of the organism, and the consequent formation in the mouth of acid, to the action of which on the enamel of the teeth he considers the caries to be due, he found that a solution of corrosive sublimate, 1 in 500;000, checked the formation of acid, and a solution of 1 in 100,000 completely destroyed the organisms. He, therefore, thinks that a solution of corrosive sublim[illegible] not strong enough to be dangerous, would be found a very effective mouth-wash. The spores of the organisms were found to remain capable of development after an hour's boiling [illegible] a solution of meat extract. The organisms were also destroyed by a solution of potassium permanganate, 1 in 1,000; [illegible] solution of carbolic acid, 1 in 500; and salicylic acid, 1 in 12[illegible] while the development of acid was checked by solutions [illegible] of their strength.—*St. Louis Druggist.*

LOOSE TEETH ON PLATES.—Single teeth on partial rubber or celluloid plates sometimes loosen, especially when the tooth stands alone in a narrow place between the natural teeth. This can be prevented by using copper wire, No. 24, nearly taking one turn around one of the pins, then across to the other, taking one turn around that also, then twist the ends together, *not tightly* or the pins may be cracked out of the tooth. Be careful that the wire is imbedded in the rubber and covered when the plate is finished. The same plan can be sometimes used when the articulation makes a very thin plate necessary. By using No. 30 wire, add teeth with pins in the proper place, a rubber plate can be made as thin as a gold or silver one. A better plan is to hard solder a gold backing to the tooth and bend it to the proper angle to be firmly held by the rubber. A hole roughly punched through the backing will help the rubber to hold it. When suitable thickness can be given to the plate, the copper wire has the advantage of being inexpenisve.—*Dental Review.*

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ARTICLE I.

THE ORIGIN OF DEFECTIVE ENAMEL.

BY W. H. EAMES, D. D. S., OF ST. LOUIS, MO.

(Read before the Illinois State Dental Society.)

At your last annual meeting I had the pleasure of presenting before this Society a short introductory paper on the subject of defective enamel structure. It embraced a synopsis of the views of the most prominent writers upon the subject, together with some objections which have presented themselves to my mind in the study and investigation of this question. Time did not permit a full confession of the subject, and now, in fulfilment of a promise made to the Society, I bring the subject before you again in the following brief paper, in which I have endeavored more fully to present my views.

The theories entertained by all writers of the present day, as to the cause or origin of defective enamel structure, differ but little, if any, from their predecessors, writing perhaps a century earlier. It seems to be regarded as one of the settled facts of our science, which, like the traditions of the Church, it were heresey to dispute; it is set forth in all our text books, and taught in all our colleges; but notwithstanding the general acceptance which it has met at the hands of all succeeding students, it seems to me, that whether it is capable of disproof or not, there is reasonable room for doubt at least—and while I do not expect to present a solution of the phenomena of these various formations which shall be accepted as true without question, I do hope to illumine some of the darker places in the misty theories of the past.

The various forms of defective enamel which, up to the present time, have been knows as rocky, ridged, furrowed, cribriform, pitted and grooved enamel, attributed to one cause, viz., arrested development, will be considered under two general heads, "Congenital" and "Non-Congenital" or accidental. The first class, "Congenital," will include all of those defects which are supposed to originate during the formative period of the tissue; the second class, (non-congenital or accidental,) those forms which originate after the complete development of the tissue.

Thus the first class, or congenital, will comprise some of those forms known and described as rocky or ridged enamel; simple pits in the structure more commonly found on the points of the cusps, but existing often on other portions, of the tooth, and especially noticeable in cases where but few of the teeth are affected: grooves or fissure in the coronal surfaces of the bicuspids and molars. The second class (non-congenital or accidental) will include some of the forms of grooved or furrowed teeth not considered in class first, described by Mr. Hutchinson and others as due to syphilis, mercury, etc.; also, cases presenting the same characteristics which occur later in life, in the form of grooves at the gingival border of the molars and bicuspids, usually considered as cases of erosion, abrasion, denudation, atrophy and caries, which, in my opinion, have a common origin.

The origin of the first class, as I believe and hope to demonstrate, is not due to constitutional disturbance affecting the epithelial structures, such as measles, eruptive fevers, mercury, syphilis, eclampsia, etc., which are supposed to cause an arrest of development and a consequent defective enamel structure, but to a defect in the formative organ, which might, in cases of pits, be termed a blight or death of the ameloblast, or in cases of fissures a "rupture," being the result of a separation of the ameloblastic layer.

Let us glance at the process of development at this period. According to the best and latest authority on this subject the enamel organ envelopes the pulp or dentine organ in the form of a hood, corresponding somewhat to the form of the future tooth. It is composed of three layers, or strata: an external and an internal epithelial layer, and a reticular layer; the external and internal layers are formed of the columnar cells of the malpighian layers of the epithelium. The internal layer of cells or ameloblasts, having undergone a change in length, are much longer than the cells composing the external layer. To the cells composing the internal layer, I have given the name "*ameloblasts*," as to them is delegated the work of forming the dentine. Just how this process of amelification takes place is not definitely determined. Whether it be by direct impregnation of the cell or by exudation, is not essential, so long as it be admitted that the formation of the enamel is dependent on the presence of the ameloblasts. The recent explanations of the phenomena of enamel formation, by Prof. Bodecker, Williams and others, if true, might affect the position taken in this paper, but being in advance of the accepted theories up to the present day they will not be considered.

There is no class of cells more liable to a change of a retrogressive character than the epithelial, and none develop more rapidly. We have seen that the enamel organ is made up of this class of cells exclusively, and is therefore subject to changes noticeable in epithelial structure elsewhere; a blight or death of one or more of the cells of this organ may be looked for at any time. If one or more of the ameloblasts die, or from any cause be wanting in the internal layer of the enamel organ at any point, then will there be a missing rod or rods corresponding in number with the missing ameloblasts, thus forming a circular pit. If the ameoblasts were missing when the process of amelification commenced, this circular pit would extend from the external surface of the enamel to the surface of the dentine beneath; but if the cells die after the process of amelification is partially completed, then the depth of the pit will correspond to the length of the rods which were left unfinished; the cells surrounding the missing ones being unaffected would complete the work assigned to them, and thus the walls of this pit will be normal in character, except, perhaps, in cases where the direction of the rods is slightly changed. Thus is formed the pit described by Wedl and others, "an opening surrounded by enamel rods and the bottom clothed with enamel."

The change which takes place in the walls of these pits from the action of external agents, acids, bacteria, etc., after the tooth is erupted, would result in the forms figured by Wedl and Magitot, and by them described as being filled with pigment, debris of tooth substances, food, leptothrix, etc. The breaking up of the rods forming the wall, giving the pit the form of a pouch or cul-de-sac, may be accounted for in this manner. It may be claimed that this would be but a form of arrested development, especially as this process of amelification is one step in the process of development; but can it be called an arrest of development "dependent upon some constitutional disturbance," as Wedl, Magitot, Tomes and others assert? We think not. It is not an arrest, but a death or blight of a cell or cells forming the enamel rods, independent of any systemic or general constitutional disturbance.

The next form to which I would call attention, fissures or grooves in the coronal surfaces of molars and bicuspids, is also accounted an arrest of development, a lack of coalescence, a failure on the part of the enamel plate, which, in its development from the cusps towards the center, fails to meet and coalesce. To Dr. Black, of Jacksonville, belongs the credit of the following solution of this defect, which, evidently, is not due to a failure to coalesce, but is rather the result of a rupture of the enamel organ at this point, a separation of the ameloblastic layer, thus separating the rods and forming a fissure.

At the period of development, when this rupture takes place, the pulp has assumed the form of the future tooth, but not its full size. Small caps of dentine are formed over the points of the cusps; the enamel organ has undergone the change noticeable in the form of the cells, and a change is taking place, noticed by Mr. Tomes and others, namely, changing from protoplasm to formed material, ready to receive the lime-salts. This change, which renders the cells stiff and unyielding, commences directly over the points of the cusps and passes gradually out from these points, as centers, towards the center of the grinding surface, and down towards the sides of the crown. The growth of the dental bulb stretches the investing enamel organ, and the points over the cusps being fixed, the strain comes directly on the softest and most yielding portion, midway between the cusps, where fissures are to be found. The strain upon the enamel sheet separates the ameloblasts, and thus a break in their continuity occurs, which is not repaired, and a consequent fissure is formed in the sheet of enamel. The term coalition implies the union of two separate portions which are independent of each other; but we have seen that the enamel grows from a continuous sheet of ameloblasts, each connected with the other, so that here there can be no failure to coalesce. It is true that the deposit of lime-salts takes place from certain points, but the receptacles for the lime envelope the entire crown. These fissures are most frequently found on teeth having prominent cusps, as in such cases the enamel organ is most subject to rupture. These cracks or fissures which before the eruption of the tooth present smooth walls of enamel rods, soon after eruption become discolored and filled with debris and leptothrix, and assume the appearance as seen under the microscope and described by Wedl. This defect in the enamel is of the same origin as the form described as pits—the absence of the ameloblasts, differing only in the cause; and most of the defects of this character, no matter what forms they may assume or where located, have this origin in which special constitutional disturbances play no part.

Of the second class of cases of defective enamel, the non-congenital or accidental as was suggested in my paper of last year, I believe a large number to be due to the abnormal action of the so-called absorbent organ. At the time when some of these defects occur the temporary teeth occupy their sockets in the alveoli; the permanent teeth are inclosed in the follicular wall, surrounded by a bony crypt, which, with the roots of the temporary teeth, must be removed to allow them to assume their position in the arch. Nature has provided an agent to do this work. Mr. Tomes designates it as the absorbent organ, composed of a peculiar class of cells resembling the myeloid cells of Kolliker. Wedl designates these cells as *osteo, or odontoclasts.* We believe them to be simply granulation cells. This organ, whatever it be, is found in close contact with the tissue about to be removed, whether bone or tooth. Cup-shaped excavations filled with this cellular organ are noticeable on the surfaces being acted upon. The removal of the roots of the temporary teeth and the opening of the crypts for the eruption of the permanent teeth is said to be a physiological process, and yet it is so nearly allied in all physical characteristics to the other processes, termed pathological, that it is difficult to distinguish between them, so as to be able to say what characteristics mark a physiological, and what a pathological process. We are of the opinion that the processes are identical, differing only in the circumstances producing them.

Again, it is stated that the method employed by nature for the removal of the temporary teeth is *sui-generis.* We must dissent from this view, believing it to be the same process that she has provided for the removal of other tissues.

The removal of the protruding stump of a limb, by the granulating cells, after the sloughing off of the soft parts, is identical in form and results, with the removal of the temporary teeth. It is simply a result following one of the phases of inflammation; the result of an excitation in a part, otherwise normal, inducing a proliferation of cell growth, which may be progressive or retrogressive in character, or both interchangeable; at one time acting as an absorbing organ, and at another as a builder up of tissue, dependent, as is generally supposed, on the amount of life-force present.

Let us apply this view of the character and action of the so-called absorbent organ to the removal of the roots of the temporary teeth. When the crown of a permanent tooth is completed and the growth of the tooth commences (if the process goes on normally,) the growth of the root forces the crown onward against the hard tissue, covering it with force sufficient to produce excitation and promote the proliferation of cell growth in the part; and these cells, so far as we are able to learn, are identical in character with those found in a granulating wound and produced under similar conditions, the same as are produced in cases of inflammation of a low type, which result in destruction of tissue.

Here then we find the development of the absorbent cells in the part ready to remove any obstruction to the continued growth of the permanent tooth. Thus is the crypt of the permanent tooth, the alveolus and roots of the temporary rooth removed. It frequently happens that the partial removal of a temporary root is sufficient to relieve the pressure produced by the incoming tooth, changing the cells proliferated from a retrogressive character; and the process of building up of tissue succeeds—and this again may be succeeded by absorption.

It is a noticeable fact that the roots of replanted teeth are frequently removed by a process identical, in all respects, to the removal of the temporary teeth. This occurs, in some cases, soon after the operation of replantation; in other cases several years may elapse before the tooth is lost. Smoetimes this work of removal commences at the apex of the root, at other times it will be noticed at the gingival border.

The removal, by nature, of the roots of replanted teeth is termed a pathological process; and yet wherein does it differ from the removal of the roots of the temporory teeth, which is recognized as a physiological process? It is, undoubtedly, one and the same process, dependent on the same causes for its action, and governed and controlled by the same laws. The conditions in the case of a replanted tooth are eminently fitted to induce this change, causing a proliferation of cell growth; the circulation in the parts surrounding the root being defective, a low type of inflammation is readily set up, and the development of cells of a retrogressive character may reasonably be looked for, sooner or later, in every case.

Just how these cells do their work is as yet an unsettled question; most writers inclining to the opinion that a fluid of exudation is present which dissolves out the lime-salts from the hard tissues with which it comes in contact. The following brief extract, from a letter by Dr. G. V. Black, Jacksonville, Ills., on "Ferment," is the best explanation of the action of the absorbent organ, and is, in my opinion, in advance of anything which has been written on this subject: "Absorptive and resorptive digestion is accomplished by a soluble ferment, eleborated by the tissues under special circumstances, for the removal of tissues no longer needed as roots of temporary teeth. The absorption of the temporary teeth is a physiological process, as all other absorptive processes are. It is brought about by the action of a class of cells which have become known as 'osteo' or 'odontoclasts.' These are only the oridinary connective tissue cells of the part in immediate proximity with the part to be removed, which have temporarily taken on new functions—the secretion or eleboration of a soluble ferment for the removal of these roots of the temporary teeth which are no longer wanted. These cells perform this act in an indirect manner. It is plain that these roots are not removed by any mere mechanical force. These cells have no physical power of growing into them; they secret a soluble ferment, analogous to the body which digests them, breaks them down and fits their substance for entering into the blood streams by osmosis, just as solid ingesta in the stomach is broken down and *fitted* to enter the circulation by osmosis.

"There seems to be no foundation for the notion that the resorption of these roots may not form proper pabulum for the building up of other tissues; that the absorbed product is necessarily excreted. From accident or decay the temporary teeth often lose their pulps, which sometimes results in the formation of an alveolar abscess. If such an abscess exists at the time absorption should take place, absorption fails, partially or entirely; the tissue which performs this function being thrown into a pathological state or condition, the secretion of the soluble ferment does not take place in the usual manner.

"If, however, the abscess does not occur, or if such abscess be cured and the tissues in immediate proximity to the devitalized root be perfectly healthy, it is found that the absorption goes on in the usual manner. The mere death of the root does not interfere with the resorption, provided the physiological condition is maintained in the immediately surrounding cells, which are the active agents in the work. The soluble ferment does not depend for its action upon the life of the tissue to be acted upon. The roots are simply digested and enter the blood streams by osmosis, as any other digested material."

Many of the forms of honey-combed and furrowed teeth (incisors and six-year molars) closely resemble, in general appearance, surfaces of hard tissue which have been acted upon by the absorbent organ; incisors, marked by horizontal ridges and furrows, are said to have their origin in some constitutional defect, causing an arrest of develepment, in the epithelial structure—the furrows indicating a period of arrest, the ridges a period of development, thus forcing the conclusion that there has been a succession of disturbance equal in number to the markings on the teeth. This can hardly be accepted as true, especially in cases where no constitutional disturbances have been observed. May not much of this marking on the incisors and sixth-year molars be due to the action of the absorbent cells? Is it not possible that, having performed their work of removing the temporary teeth and the alveoli, they continue to act and remove the enamel cuticle and dissolve out the lime from the freshly amelified enamel rods with which they come in immediately contact at the gingival border?

The succession of furrows observed, may be accounted for by assuming that there is a period of growth and a period of rest for the incoming tooth; the cells, acting upon the enamel when the tooth is at a period of rest, form a furrow or groove across the surface. When the period of growth sets in, the tooth shoots onward, and a portion of unaffected, perfect enamel passes beyond the reach of their influence, forming a ridge; again a period of rest sets in, and again the cells act upon the enamel brought in immediate contact, and another furrow is formed; thus any number of furrows and ridges are formed, dependent upon the continuance of the abnormal action of these cells. As this action is due to systemic conditions, all teeth in contact with the organ at the time are alike acted upon; hence the relative position of the markings on the incisors and canine teeth.

The sixth-year molar is acted upon in a similar manner by the organ which lies directly over and in contact with the grinding surface. The surface presents a series of pits and cup-shaped excavations, reaching, at some points, the dentine beneath. Spines of perfect, unaffected enamel, the full depth of this tissue at this point, are frequently seen surrounded by these pits and excavations; the change noticeable in color, and the rounding up of the otherwise sharply outlined borders of these excavations, is due to subsequent action. The cases known as erosion, occuring at the gingival border, are in many instances, undoubtedly the result of this same action of the granulation cells. What the conditions are which contribute to this abnormal action are, as yet, a hidden mystery. Like many other afflictions to which flesh is heir, we know not the cause thereof.

Touching the action of these cells, I quote another paragraph from Dr. Black's lecture on "Ferments," which may, in somewise tend to clear our minds on this subject: "We have reasons to suspect, at least, that soluble ferments are often found in places where they are not wanted. Tissues are stimulated to false secretions by various irritants and in many ways.

It is probably that many of the excriating secretions, often met with in children, are soluble ferments given out through some mal-condition of the tissues. We have reason to suspect that, in some, decay of the teeth may come about in this way. We have already seen that tooth substance is digested and removed by a soluble ferment normally formed; the same is possible in an abnormal way. We have often noticed a peculiar irritated condition of the gums about the necks of the teeth, especially the inferior incisors, and that decay occurs in these portions exposed to the secretions thrown out. Twelve years ago, long before the conception of the ideas inculcated in this paper, we called attention to the connection between this irritation and decay, in a paper before this society. Irritation from a clasp-plate forms cavities for lodgment of colonies of bacteria.

Drs. Underwood and Miles, of London, claim to have found a form of growth in the mouth which grew directly into the surface of the teeth, otherwise perfect. Dr. Miller, of Berlin, seems nonplussed by the fact that he finds the softening of dentine in caries always in advance of the organisms. This is exactly what we should expect to find;

for if decay is produced by the organisms, it must be by the digestive fluid, soluble ferments thrown out by them, or by their waste of products. When Dr. Koch was examining the gangrene, produced in mice by the coco-bacterium of hospital gangrene, he found uniformly that the tissues were destroyed in advance of the bacteria. The bacteria seemed not to touch the living tissues at any time after the work was fairly begun, the tissues being destroyed in advance by the soluble ferment."

[TO BE CONTINUED.]

ARTICLE II.

THE SEPTIC THEORY OF DENTAL CARIES.

BY F. SEARLE, D. D. S., SPRINGFIELD, MASS.

(Read before the Connecticut Valley Dental Society, June, 1884.)

In 1877 Arthur S. Underwood, M. R. C. S., L. D. S., England, and W. J. Milles, L. R. C. P., London, F. R. C. and C., undertook "to determine, as far as possible, to what extent germs are present in the dental tissue when in a state of disease, and to deduce conclusions as to the effect of their presence." After four years' patient investigation they published their first report of their progress in a paper read before the International Medical Congress, in which they say:

"We consider that caries is absolutely dependent upon the presence and prolification of organisms. This view we propose to call the 'septic theory.'"

In the examination of this theory, it will be necessary to go over a somewhat extended field of inquiry, and introduce some other theories for examination. Investigators into the phenomena of diseases are liable to seek an explanation in the insufficient evidence of their own discoveries, without taking into account what others have done or are doing in the study of questions bearing directly upon the subject which they are examining. Especially has this been the case with recent investigators of dental caries.

When Underwood and Milles in England were making their investigations in relation to organisms, they seemingly did not take into account the discoveries of Dr. Boedecker, of New York, in relation to the distribution of living matter in bone, dentine, enamel and cementum, or of the observations of Dr. Abbott respecting the evidence of inflammation in diseased fibrils. Dr. Abbott was equally uninformed of what Underwood and Milles were proving in regard to the presence and agency of germs in the fibrils. He saw the evidences of inflammation, but not, as I think, the true irritant. Underwood and Milles saw the irritant, but not the inflammatory appearances of the fibrils, or at least did not take them into account; consequently, they announced their septic theory, and Dr. Abbott his inflammation theory. The reviewer can gather and arrange all the evidences from all sources and thus form an unbroken chain of evidence, composed of demonstrated facts and legitimate deductions from those facts, which will explain more than any theory supported only by incomplete and one-sided observations.

I propose to gather up the important facts which have been reasonably well established, bearing upon the question of caries, separating them from mere opinions, and endeavor to find what they teach.

Our subject is intimately related to questions which have occupied the attention of chemists, for more than two hundred years. It is, in fact, one of the latest questions of a large and rapidly increasing number, growing out of those minute yeast granules which Leuwenhoeck discovered in 1680, and which Cagniard-Latour, and Schwann re-discovered in 1836–39, and which were the starting point of that long discussion between Pasteur and Liebig and their respective schools of the true theory of fermentation, which lasted from 1840 to 1870, and which the illustrious Pasteur has completely answered by a series of experiments which, in the language of Milles, are "classed among the most brilliant records in the history of science." "The true ferments are now known to be living organisms that produce fermentation as a function of vital activity." Unlike the soluble ferments, these living organisms increase at the expense of the substance fermented. The true fermentations are purely physiological processes, which are defined by Pasteur as the "direct consequence of the process of nutrition, assimilation and life when they are carried on without the aid of free oxygen, or as a result of life without air." (P. S. M., pp. 225.)

. The discoveries of Schwann, Pasteur and others, in regard to the agency of the germs of micro-organisms, laid the foundation upon which Lister, 1865-67, established the germ theory oı contagious diseases, and the septic character of some diseases not so contagious, Lister, an eminent French surgeon, had previously exhausted all the resources of the old methods of dealing with septic diseases by efforts to exclude the oxygen of the air from wounds, etc., with unsatisfactory results. The revelations of Pasteur opened his eyes to the fact that his foundation principle was defective, and consequently his methods could not be suceessful. In 1867 he published the results of his antiseptic (and aseptic) methods which he had been testing for two years, with previously unheard-of success. This brought about the great revolution in general surgery which immediately followed, the principles of which have been generally accepted, and now direct the methods of surgery. Without the discoveries of Pasteur and Lister the germ theory of dental diseases would have long been deferred.

In 1873, Liebig and Rottenstein, published their work on Dental Caries and its Causes, which contains much of interest upon the existing theories, especially in relation to the germ theory, which they were the first to put into definite form. But the chemical theory held its ground in spite of their discoveries, because there was no Lister to give clinical demonstration of the correctness of their views. We hear but little more upon the subject in general allusions to the theory in partial approval, or total dissent, until 1881, when Underwood and Milles published their first paper.

The failure of the chemical theory by acids to explain satisfactorily all the conditions present in caries, led these gentlemen "to seek for the presence of organisms in carious dentine with results that far exceed their expectations."

Their first paper contains the following conclusions:

1. "We consider that caries is absolutely dependent upon the presence and prolification of organisms; that these organisms attack first the organic material and, feeding upon it, create an acid which removes the lime-salts." . . .

2. "That suppuration of the pulp and its sequences, such as alveolar abscess, depend also upon the successful working of organisms."

In their second paper they say: "We are anxious that you should keep clearly before you four main issues upon which all the theory which we suggested to you in 1881 depends:

1. "That certain forms of micro-organisms, viz: Micrococci, oval bacteria and short bacilla, are invariably present in carious dentine."

2. "That these micro-organisms extend into the tissue as far as does the caries."

3. "That no agent can be made to produce a change resembling caries in the absence of such micro-organisms."

(The fourth I omit.)

They add: "We feel convinced that the process, to be effective, must be carried on in a living mouth, probably because that is the only situation in which the special germs are really active. Analogy seems to warrant this deduction; but, "all we claim for the germs is, that without them and their products the process could not go on at all," and "the dental pathology of the future must include them among the most powerful factors in the production of this disease."

To Underwood and Milles the world is indebted not only for the facts which they were the first to demonstrate, but also for the impulse which their labors gave to other men to make additions to their discoveries.

In the *New England Journal of Dentistry*, January, 1883, Prof. Mayr gives the results of a series of very careful experiments made in the line of analyzing decayed dentine. Of these experiments Underwood and Milles say: "Prof. Mayr has worked out the chemical aspect of the question with great care and exactness." That he is fully competent for a work of this kind, involving great care and labor, no candid man, who is at all acquainted with him personally, with his educational training in the best schools in Germany, his acquantance with medical and other sciences, and especially his ability in his chosen profession as a chemist, will for a moment question. I give the results of his experiments on the point bearing on the question of dental caries. First, he says: "Let us never confound two things; the structure of a tooth and the chemical nature of a tooth, and that the structure may be broken down and the chemical nature not changed. Result No. 1. No acids or chemical lime-salts are found in the innermost layer is almost (and as was seen in some cases completely) identical with that of healthy teeth, the structure is totally different. The soft, white, friable decay is no longer organized, though chemically only slightly differing from the tooth substance—one showing 2 per cent. lime-salts. The action at the innermost layer is not in accordance with what we know about the action of acids."

This paper of Prof. Mayr is full of suggestions and facts bearing directly upon the chemical aspect of the question of caries, and furnishing much evidence in favor of the septic theory.

Dr. W. D. Miller, of Berlin, within the last two years, has published many papers giving at length the processes of his experiments and observations relating to caries, which deserve notice. He then gives the description of the investigations which led him to several conclusions, of which I quote the following:

"The bacilla penetrate far into the dentine, even into the finest branches of the canaliculi. Micrococci penetrate furtherest" (*i. e.*, further than the minutest branches (?)). "The fungi produce anatomical and pathological changes in the deeper layers, stop up the canaliculi and necessarily lead sooner or later to the death of the dentinal fibrils. The outer layers of dentine, thereby deprived of nourishment, die and fall a prey to putrefactive agents."

Dr. Miller thus fully confirms the observations of Underwood and Milles, of Lister, and Rottenstein, and every other careful observer, and the presence of organisms in the deeper portion of carious dentine may be considered as fully established.

Dr. Miller differs from Underwood and Milles in this: He claims that there is a zone of softened dentine between that occupied by the organisms and the healthy dentine, which is not infected. His opinion is based on microscopical observations, and this after having said that the bacilla penetrate even into the finest branches of the dentine (softened dentine), and the micrococci penetrate further still.

Underwood and Milles, on the other hand, prove that the germs are present up to the uttermost limit of the affected dentine, by inoculating a pure culture with matter taken from the deepest portions thereof—from the very border line of decay. In other words, they find them attacking the living *organic tissue* of dentine. The question of the effect of their presence here is now the one of paramount importance. The settlement of this very interesting question does not depend upon what organisms or acids may be doing at the more superficial points of the carious mass, nor whether the acids are organic or chemical, but what is going on at the line of battle where the amæba-like cells of the organisms and bioplasson are contending for dear life and for food to sustain that life.

Neither Underwood and Milles, nor Dr. Miller, are able to solve this question on the theory that organisms do their work by the acids which they produce. The former say: "The essential element wanting in our artificial experiments is present in the mouth." Dr. Miller says: "I am a believer in acids, a believer in micro-organisms, and a believer in an unknown cause; that is, I believe that there are agents active in the production of caries which are yet to be discovered.

Two questions here arise:

1. Is the tooth endowed with living matter capable of taking on inflammatory action?

2. Is there evidence to conclude that the results of inflammatory processes in dentine are analogous to those in bone and other tissues?

In answering the first question, I will refer you to the discoveries of Prof. Heitzmann in relation to the reticular structure of protoplasm, which connect every tissue and organ as it were into one large amæba, and to the researches of Dr. Bodecker, concerning "The Distribution of Living Matter in Human Dentine, Cement and Enamel," together with the evidence which your own experience furnished in your operations upon the teeth. If these, united, do not bring evidence to your minds sufficient to make you give an affirmative answer, ask your patients. Do not think, because these tissues belong to the microscopic world, that they cannot be injured and take on inflammation. All normal and abnormal life action, whether growth or decay, the building up or the taking down of molecules and tissues, belong to the microscopic world. If you discard the vital changes in one set of tissues, why not in all? Yes, there is the intensest vitality in the reticular matter of the tooth. To talk of its low vitality is to contradict the plainest evidence that can be brought to the human intellect.

In answer to the second question, if you admit the self-evident fact of its ability to live and grow and be healthy you must also admit its liability to disease.

This brings me to the consideration of the inflammation theory of Dr. Abbott.

It has been shown in the laboratory of Prof. Heitzmann that dentine has been dissolved and formation of abnormal tissue has taken its place. This has taken place by true physiological, though abnormal, vital processes. When Dr. Abbott was making his investigations in connection with Dr. Boedecker in regard to living matter in teeth, he, observed in the diseased fibrils of the tooth appearances characteristic of the presence of inflammation in other hard tissues, which he thus describes:

"First, irritation, which he thinks is produced by acids, followed by inflammation, swelling of the living matter, which effects the dislodgment of the lime-salts; a melting down of the glue-giving basis-substance, and a bringing to view the embryonal elements of the enamel. These processes follow in greater intensity in the dentine. The lime-salts are not necessarily dissolved and taken away, but may, and I have no doubt, as Prof. Mayr's experiments show, do remain mixed with this disorganized tooth substance." On the hypothesis that acids produce the irritation of the living matter—the reticulum—at the border-line of decay, why should they not also decalcify the lime-salts at this line? Prof. Mayr finds no trace of acids there, and Dr. Abbott accepts the conclusion that they are not there. How, then, can acids set up inflammation? When the germ theory is accepted, the presence of acids at this point will be necessary to account for the agents of irritation. With vital organs feeding upon and multiplying within the pabulum contained the canaliculi, exhausting and injuring the reticulum, which is directly connected with the reticulum of the pulp and the whole system of tissues, the usual effects of irritation follow until the melting down of the formed material, the liberation of the lime-salts from its meshes and the death of the reticulum put an end to the vital reaction, and the mass is given up to the action of organisms and their products.

The facts already presented are sufficient to establish the septic character of the disease affecting the albuminous or "animal" portions of dentine where caries is present.

In another article I shall present some of the facts already discovered in regard to the action of pathogenic organisms on soft tissues, and also examine the chemical theory which teaches that caries is simply the decalcification of the dentine by acids.—*New England Journal of Dentistry.*

ARTICLE III.

THE CHEMISTRY OF CARIES.

BY W. C. WARDLAW, M. D., D. D. S.

[Read before the Georgia State Dental Society, May 24th, 1884.]

Caries is, perhaps, the most universal ill to which flesh is heir, and the importance of the study of its chemistry is conceded by the entire dental profession. Its ravages, and the advance of science alike, forbid content with the knowledge hitherto attained, but urge still further progress in search of curative treatment and preventitive measures. The fixed routine, tread-mill practice of our fathers, of stuffing teeth with gold, tin, &c., will not do; we must look for the initial cause of this trouble, which antagonizes us, and as we become better acquainted with its peculiar characteristics, we will be able the more intelligently to combat it.

Chemistry being, next to mathematics, the most exact of the sciences, it might seem at first blush an easy matter for the practical chemist to take tooth-substance and acids, and by a system of experimentation, classify the varieties of caries and determine the respective acid producing each. But the oral cavity contains such a conglomeration of matters, and presents such a concatenation of modifying circumstances, that the numerous chemical reactions are distinguishable only by the most scientific expert. Making no pretension to any such qualifications, I can in this paper only travel over the ground surveyed by others, and endeavor to clothe their deductions in such language as may by its novelty, commend them to the minds of some of you. In doing this, I am naturally inclined to follow in the track of that great pioneer in dental chemistry, Dr. George Watt, of Xenia, Ohio, although Miller andothers are not in perfect accord with him.

The various theories of caries have been so closely studied and so warmly discussed by their respective advocates, that one after another has been eliminated, until now there seems to be but two urging their rival claims before the profession, the acid and the germ (bug) theory. We freely admit the presence, and possibly active, influence of bacteria in the progress of caries; but that they are the prime and potent factor in the case, recent investigations seem to disprove. Miller, of Berlin, has most exhaustively and scientifically studied this question, and has come to this conclusion.

The visible effects of caries show it to be a process in which tooth-substance is disintegrated, broken down and washed away. This dissolution can be experimentally duplicated within and without the mouth, through the agency of acids. We therefore assume the truth of the acid theory, and proceed to investigate its "rationale."

The teeth are composed of organic and inorganic, or animal or mineral matters, held together by the powers of cohesion and chemical affinity, and acted upon, as all substances are, by mechanical and chemical forces. The constituents of enamel are inorganic mostly, phosphate of lime (bone phosphate) and carbonate of lime constituting about ninety-five per cent. Dentine, though having more animal matter, is composed of like elements in less amounts. The mineral acids readily unite with these earthly bases, forming salts of various degrees of solubility. If, therefore, we take such acids as sulphuric, hydrochloric and nitric, having this affinity for these bases, and place them in contact with enamel or dentine, chemical action at once supervenes, the strongest affinity asserting itself, and new compounds are evolved.

It is well here to bear in mind that chemical action is definite and specific. There is no uncertainty, like combinations always produce like results. One element combines with another element and produces a third substance; always, that, and never another. Hence, we should be able to prove our position, both by analysis and synthesis. We should, as the lawyers say in regard to circumstantial evidence, be able to establish our theory upon this supposition to the reasonable exclusion of all others.

The action of acids upon the teeth are modified by their concentration or dilution of the organization of the tooth, and by the resistance of vitality. Thus, if a dilute acid is placed in contact with dense, tooth-substance, it acts slowly upon it, making careful selection, however, of the particular element with which to combine; and " vice versa." A well-organized tooth, too, is of course more resistive than one with seams and cracks and poorly calcified materials. With these, and other modifying influences duly considered, a carefully conducted series of experiments would ascertain for us the specific effect following the contact of the various acids with the teeth. And such has been done for us.

Sulphuric acid, e. g., has such affinity for water, that it will decompose most organic substances (composed of oxygen, hydrogen and carbon), in order to gratify its desire, leaving dark traces of its foot-prints in the uncombined element, carbon. If, by means of a crack in the enamel, or a poorly calcified spot, or a rough point on a tooth, sulphuric acid, dilute or concentrated, gets a hold upon the tooth, the enamel is gradually disintegrated, the sulphuric acid uniting with the carbonate of lime, leaving the animal matter discolored. Dr. Watt maintains that this is the agent causing the dark appearance in that species of caries known as "black decay," which is generally superficial, slow in progress, and of a dark, often polished, appearance.

He says, that in this variety the organic matter is blackened, or carbonized, but there is only slight disintegration, of tooth-substance; just the effect we would expect to observe, where the sulphuric acid unites with the carbonate of lime, which is protected, as it were, by the more abundant and insoluble phosphate of lime circumjacent. There is no difficulty in accounting for the presence of this acid in the month, because the always-abundant supply of sulphurette hydrogen is readily oxydized, affording water and sulphuric acid.

To explain rather more fully: The constituents of the enamel, animal matter, carbonate of lime, and phosphate of lime, are commingled throughout. The phosphate of lime being in excess and not decomposed, the acid cannot penetrate very deeply into it, and it therefore protects, in a measure, the carbonate of lime from destruction, and serves to maintain the shape of the part.

The animal matter is not entirely decomposed either, but is carbonized; that is, its oxygen and hydrogen go to form water, which is greedily seized upon by the sulphuric acid, leaving the carbon in its natural blackness. Hence we see the disintegration is small, the decay is slow, and the color is such as to give the name of "black" decay. Sulphuric acid will give results similiar to these outside the mouth as well, and no other acid will, hence the reasonable conclusion that it is the destructive agent in "black decay."

Proceeding from the decidedly black decay, we find the color gradually becoming lighter, until we reach that generally denominated "brown decay."

Let us next examinine its physical characteristics, and look for the chemical agent, which has been at work to produce them.

Here the color, in the well-marked type, is brownish, the decay is more penetrating, the progress is more rapid, and the residum is of a semi solid, tough, leathery consistency.

Evidently the earthy constituents have been the first dissolved, and then washed away, leaving the organic, or animal matter partly dissolved and in process of fermentation and putrefaction. Hydrochloric acid has been getting in its work here, and something after this manner. The carbonate of lime and the hydrochloric acid are mutually decomposed, the results being water, carbonic acid and chloride of lime. This chloride of lime is a very soluble salt, and is readily washed away by the fluids of the mouth, whilst the carbonic acid escapes as gas. The phosphate of lime is also decomposed, forming a soluble compound, which also being removed, we have left the animal tissue almost untouched; hence the leathery layers of sensitive matter.

This action is well illustrated in the common experiment by the anatomist, where the lime-salts of a bone is dissolved away by hydrochloric acid, leaving the gelatinous portion untouched and still preserving the original form of bone. I have seen the humerus tied into a knot after having been so treated. Now, does the mouth furnish the conditions necessary for the formation of this powerful mineral acid? It certainly does. The great affinity of chlorine for oxygen results in the formation of hydrochloric acid, when ever they are brought within the spere of their affinities. The one article of chloride sodium (common salt) so freely used as a condiment, and which too is always found as a constituent of the saliva, abundantly furnishes the necessary chlorine to the expectant oxygen.

And next we have to face that other foe, which practical experience has taught us so much to dread—"white decay."

Nitric acid, we believe, may be so associated with "white decay" as to account for all of its destructive features. We are all painfully familiar with its whitish appearance, very rapid destruction and sensitive surroundings, and also the difficulty of arresting its progress by filling. Nitric acid is such a powerful solvent that but few substances can stand before it, and both organic and inorganic tooth tissue succumb to its powerful influence. The soluble salts thus formed are promptly removed, exposing fresh surfaces to be displaced in like manner. If it is in concentrated form or considerable quantity, it sweeps with the besom of destruction. If it is more dilute, it more quietly chooses the material for which it has the greatest liking.

Dr. Watt proposed a very plausible theory to account for this dire destruction. Nitric aid can be, and is, formed in the mouth—although some investigators dispute the fact, because they have not found it present in a free state, in which condition it would, as they claim, be general it is destructive, and not confined to the limits of a carious cavity. They lose sight of the fact that it combines, atom by atom, as fast as it is formed (which is its nascent condition) with the elements of tooth-substance.

Nitric acid, as you know, is composed of $N_5\theta$, and though these two elements unite in several proportions, this is their favorite combination—the others readily decomposing and yielding to this.

In the oral cavity, all the conditions necessary in the case are present. All we want is a supply of nitrogen to be oxydized. Oxygen is universal, in the mouth, everywhere. Ammonia, too, is frequently present in the mouth, as can be detected by its odor, and sometimes, too, it is there combined with that most offensive compound, sulphuretted hydrogen. Ammonia is composed of nitrogen and hydrogen, and whenever oxygen is supplied, it is decomposed into water and nitric acid. Wherever there is putrefaction there is ammonia formed, and if to it we can supply oxygen, we have our nitric acid.

Thus we satisfactorily account for the presence of nitric acid, and reasonably explain its "*modus operandi*" in "white decay." It is often, also, administered as a tonic.

Miller disputes the agency of nitric acid in "white decay," because he has found putrifying meats in cavities of decay, and obtained, from tests of the cavities, an alkaline instead of an acid reaction. This is in accordance with our theory. The alkalinity is due to the ammonia in the putrefactive process, which is always in excess—the necessary amount of oxygen being added to a portion of ammonia, an atom of nitric acid is at once formed, and immediately, in its dascent state, combined with the tooth element, leaving no acidiiy to be detected. *Our* nitric is never in excess, and its action is always instantaneous and local.

To lactic and acetic acids is generally assigned the responsibility of destruction in that form of decay known as "chemical abrasion." The animal and earthy portions of the teeth are equally and rapidly acted upom by them, very soluble compounds being formed which are promptly washed away. Hence, the even, smooth, non-colored surface here presented.

These acids are frequently introduced into, and are readily formed within, the mouth, and if concentrated, and undisturbed for a limited time, will produce just what we so often see to our dismay.

It is difficult to explain the location and the peculiar form of this erosion. The labial surfaces and the cutting edges of the incisors are its favorite localities, instead of a general diffusion over the surfaces of all the teeth.

It would seem that the agent must be located, or concentrated, at the exact point of action, and in order to get it in position, I have supposed that it is an acid mucus copiously secreted, and eliminated by the mucous glands of the lip in the one case, and of the tip of the tongue in the other.

Malic, citric, butyric, and other acids, in concentrated form, would effect the teeth by corroding their general surfaces, as in the case of "setting the teeth on edge," and thus predispose them to be acted upon by the mineral acids, favorable located.

Being very soluble acids, they are readily diluted by the saliva, and are not apt, therefore, to act upon definite points. In the case of those sensitive spots about the festoons of the gums, it may be more easily understood that they are the results of acetic acid, formed by fermentation at the point.

Whilst we have treated of these several will-defined types of caries, there are cavities of decay not definitely belonging to any particular one of them, but having some characterisjcs of the others. So it is not necessary that there should be in each case but a single agent, and it acting continuously, There may be two or more different acids, acting together or in conflict, alternately or intermittingly, producing these blended varieties.

The scope of this paper will not permit an investigation of the process and effects of fermentation, vinous and acetous upon the teeth.—*Southern Dental Journal.*

ARTICLE IV.

PROGRESS IN SCIENTIFIC AND ARTISTIC DENTISTRY.

BY DR. E. PARSONS, SAVANNAH, GA.

Gentlemen:—The subject I have chosen for your consideration at this, our annual meeting, is large and broad enough to fill a large volume, and you will please excuse me if I only present an outline of it with incidental remarks.

This subject might be properly treated historically, and thus elucidate its progress. But what we most need now, is the best means for perfecting ourselves in our chosen profession, and thus enlarge our spere of usefulness. The age in which we live is a progressive age, full of new inventions, and in nothing is it more remarkable than in our profession. *Progress, progress,* should be our watchword, and for this end was this Society formed, using the best means to advance both our own and the public good. There is inherent in every human mind a desire to know something that it does not know, and the stronger this desire is, the greater will be the amount of knowledge acquired (opportunities, permitting,) in either an office, profession or calling.

Beyond a doubt, a zeal not according to knowledge has been a fruitful source of error in all ages. Let it not be so with us; science has to do with both apparent, and real truths; the sun appears to move around the earth, but by study, observation and experiment, we are able to demonstrate the contrary, which is the real or scientific truth. The fallacy of the senses often betray us in our search after truth.

It is well known that reflex action will produce a great disturbance in the parts more or less distant from the cause. To illustrate: Many years ago, I had an acute pain in my lower front incisors; I examined them carefully and found them perfect, but on further examination I found the interior third molar decayed at the margin of the gum; it had never given me the slightest indication of the disintegration going on. I had it extracted, and the pain in the incisors was immediately relieved. A large portion of those that suffer from facial neuralgia is caused by defective teeth, You know that any treatment in such cases is useless, unless the cause is removed.

It is only by comparison that we can realize the wonderful progress that has been made in the last fifty years in both the arts and sciences. Fifty years ago the general status of our profession was like a child beginning to walk; I know of but three books avalable then designed to assist the student of dentistry; the authors were, Bell of London. Fitch, of Philadelphia, and Snell, of the same place. Not a single periodical known, devoted to dental information. The teeth then used to supply the lost organs, were mostly human teeth, or carved out of the tusks of the Hippopotamus. About this time, Stocton introduced his mineral teeth; they were so conspiciously different in appearance from the natural ones, that many preferred human teeth.

We took our moulds to a brass foundry and had brass castings to stamp up our base plates. A little later blocks were carved out to suit each case, a sample block I present for your inspection. In 1835, Dr. S. Spooner's work, "Guide to Sound Teeth," appeared, and it was made known the efficacy of arsenic, by which means the nerve of a tooth could be devitalized in a few hours, if properly applied.

In 1843, Godard's Work on the Teeth, with fifty plates illustrating its contents, appeared, and is still of great value to the dental student of anatomy. I need not mention our colleges, for you all know what they have done to advance the cause of dental education.

We now have books and periodicals in abundance, which will compare favorable with those of any other profession, and all may keep themselves posted up if they will.

Progress in mechanical dentistry is as marvelous as in any other department of human industry. The great advance in the manufacture of artificial teeth, from a rude beginning, is now so perfect that, in appearance, they are often mistaken for the natural organs. You can get a set of fourteen for the same price we had to pay for a single human tooth fifty years ago; the introduction of rubber, celluloid, and fusible metal, has added tenfold to the demand for them. The improvements in instruments, and the various modern appliances for executing difficult operations, are beyond all praise.

The scientist is not satisfied until he has ascertained the true cause of the effects that comes within the sphere of his observations; to do this he must diligently study the laws that govern both mind and matter. To illustrate: Take any simple substance, we find the quality of the mass the same as the particle. Take gold; its quality all recognize; the union of its particles forms a large body, and is worked into various forms of use and ornament, and is the standard of all values. The particles are held together by a universal law, and this law we call cohesive attraction. The effect is patent to all, but science alone reveals the cause. The true cause is an eternal active force, operating in both mind and matter; simple as it may seem, this law is like to like, varied only in recipient forms; suspend this law, and we should not be here, everything would be chaos. Gold, by proper manipulation, is brought into a state, when cold, on which this law has increased force; thus we have cohesive gold, creating a new era in the art of filling teeth.

We cannot scientifically treat the various diseases which belong to our specialty, without a knowledge of chemistry physiology, pathology, and therapeutics. There are many carious teeth, if filled without proper treatment, are sure to give trouble afterwards. The preparation for filling a tooth requires scientific knowledge; unless we possess a good degree of mechanical skill also, we cannot do the work in the best manner—science alone, or art alone, cannot produce a well educated dentist. The mechanics may construct fine specimens of art, his materials are void of life, we have to deal with living, and often exceedingly sensitive, tissue; hence a knowledge of the above-named sciences are of great importance to us. Add to these animal magnetism, electricity, and cohesive attraction and motion, and a careful study of the varied phenomena and causative principles of these will add greatly to our ability, both professionally and socially; all cultivated minds respect intellectual acquirements, and elevate the possessor far above the ignorant pretender. Our colleges lay only a good foundation for dental education; after leaving college, the first thing to do is to select a field of labor in which to build up a good reputation, without which no one can succeed in his chosen profession.

A mind well stored with useful knowledge, combined with faithful service, punctuality in business, and a gentlemanly department, will always command the respect of good society.

Again, there is no cohesion between any metallic filling and dentos; the cavity must be formed in strict agreement with mechanical laws or the filling will not serve the purpose intended, and surely disappoint both patient and dentist. Success in this department depends on a practical knowledge of both science and art. Some of our mineral plastic materials cohere and may be held in position in almost any formed cavity, and are highly useful in many cases. The misfortune is, the composition has not yet been discovered that, in appearance and durability, is all our patients desire. Many chemists are now hard at work experimenting with various materials to produce a cement that will chrystalize, resemble the enamel of a tooth, and be as durable as gold. Experiments in this direction are yet in their infancy, and chemical sciences in its future developments may produce this desired result. When we reflect on the inventive genius of the age, we need not be surprised at anything new not heretofore known.

True science is a knowledge of causative principles on any subject the human mind is capable of contemplating. If we have a good knowledge of therapeutics and make a correct diagnosis, we can readily apply an efficient remedy in any case we are called on to treat. The man of science takes into due consideration the varied idiosyncracies or pre-disposing cause of disease; hence, we need a variety of remedial agents. Every mistake made is like a black spot on a white garment. The uneducated dentist works by guess, and makes many mistakes, often doing more harm than good, and this is our strongest argument in favor of a thorough dental education; to know when and how to treat all diseases in the oral cavity of all who practice our specialty. Brass, with the ignorant, may pass for gold; but if we educate the people, the counterfeit will be protected, and such a thing as an ignorant dentist will soon be amongst the things of the past. Whatever our attainments may be, carelessness in manipulation will often seriously damage an otherwise well earned good reputation.

In the winter of 1842, a gentlemen of generally acknowledge ability, visited Savannah, as he had done three or four winters previous, to practice the then known art of dentistry, which consisted almost entirely of filling and cleaning teeth, and substituting artificial ones for the lost organs; but the very first week after his arrival, in filling a molar tooth he let his instrument slip; it passed through the cheek and made a very painful wound. He had for a patient one of our most respected ladies. The news spread rapidly, and his intended visit was shortened, as his former patrons failed to call on him. He remained in all but two weeks; and did not make his expenses; his patrons preferring to trust the new dentist. His loss was my gain. I mention this incident as a cautain to all. Our patrons will not excuse carelessness.

The subject of this paper requires a brief notice of amalgam, which is now so extensively used in filling teeth. If my memory serves me right, about the year 1833, the Crawcours came to this country to introduce what they named the Royal Succedmeum, which was simply the filling of siver coin made plastic by the addition of murcury; by means of the press, and a bold assertion that it was a better preservative, and as durable as gold, they attracted public attention to this wonderful new discovery. They were for a short time liberally patronized, filling all decayed teeth in the most imperical manner. Those who submitted to their operations soon became disgusted with the horrid discolorations of their teeth, and had the filling removed—everyone condemned it.

The Crawcours sold their secret and left the country. It was some time after, Dr. Towsend, of Philadelphia, added tin, and called it amalgam, advocated its use for filling some badly decayed teeth, asserting that he could save, by its use, some that he could not save with gold. This caused scientific experiments, which have been going on from that day to this, prompted by a desire to produce a compound plastic metal that in the process of hardening would neither shrink nor smell, resist oxidation and be as easily kept clean as the tooth itself. You all know how near this desired end has been attained.

In all compound metallic bodies, each metal retains its identity, and although it may appear to be lost in the mass, the chemist can separate them, and free either of them from all other substances. The causative principle of cohesion, by which the particles of a simple substance are united, and made a large body, if true, by what law can a compound body be formed? Science alone can reveal the mysteries of this problem. What is known as matter in general we divide into four classes, namely; gases, liquids, minerals, and metals. Each class, viewed in itself, is distinctly different, and, as you all know, almost any kind of a compound can be effected with them by proper manipulation.

All things in the created universe, whether it be atoms or worlds, are created for uses. The union of the supreme, and ever active, law of use, conjoined with like to like, are the true causative principles by which means every variety of form ever has been, or ever will be, effected; they operate on the world of matter, as will and understanding operate on the mind. Suspend either of these laws and there would be an end to progress, procreation would cease, there could be no development of anything new, and science and art would be known no more. And now, allow me to say, our proceedings are published in our periodicals, and meet only the eye of the dentist; can we not have at least a synopsis published in a daily paper in Atlanta, Augusta, Columbus, Macon and Savannah? do this, and the public will better understand and appreciate our efforts to rid the State of ignorant pretenders, which, all must acknowledge, is for the public good. We cannot possibly elevate the standard of our profession in this State, as it should be, without the co-operation of its honorable and intelligent citizens.

Progress in science and arts is accelerated ten fold by associated effort; this is as true in our profession as any other; he who seeks to obtain honors for himself alone, does violence to our common humanity, and is an effigy of selfishness, supposing that he knows all that is worth knowing. The true scientist is ever on the alert to increase his knowledge and rationally understand causative principles; he has no fear of exhausting the storehouse of knowledge; every new truth reveals new fields to be explored, and he delights in communicating the same to others, though the infinitely large and the infinitely small will ever remain incomprehensible to the finite mind; yet the telescope has made the astronomer acquainted with the vastness, numberless and oder of the heavenly bodies, and the microscoped has brought into view the wonderful organization of animated nature, and is of vast importance to us who have to treat the various diseases of the oral cavity. Histological science would be of little value to us, if this useful instrument had never been invented. But now we are able to penetrate deep into the heretofore mysterious formation of animal tissue. With this, and the spectroscope, many valuable discoveries have been made in the obnormal conditions of the blood, especially when a person is brought into a state of insensibility by the use of anæsthetic agents. This Society has done much in elevating the standard of dentistry in this State, but vastly more would be accomplished if all honorable members of our profession would make greater exertions to meet with us; no great achievement has ever been made in science and art, without individual sacrifices of both time and money. The best dentist in this State will surely learn something to his advantage by meeting with us, that would far outweigh his expenses.

Any petty jealousies that sometimes exist towards a brother dentist should be buried out of sight, and make the good of all, our good, which is the most exalted state of true manhood. Every graduate of a dental college should meet with us, and help us in our effort to banish quackery from the State. I ask them to consider what this Society has done for their protection? If the self-sacrificing enterprise of a few dentists to organize a State Society, had not been made, the State would be even now over-run with ignorant pretenders, which would be a disgrace to the very name of dentist. In conclusion, I present the following aphorisms, which will benefit all who heed them:

1st. There can be no progress in scientific and artistic dentistry without study, observation and experiment.

2nd. An aversion to any kind of labor is a double tax on the nervous system of the performer, and the only possible satisfaction is the remuneration received for it.

3rd. Without a love for a chosen profession, opportunities for improvement are neglected, no progress made, what is done, is from necessity, and not from any pleasure therein.

4th. A laudable ambition to excel in what we undertake to do, is the high-road to eminence, and always deserves success.

5th. To make this life a happy one, the golden rule should be our guide in all we do.

6th. Dissipation and debts are the two greatest enemies to human happiness; always avoid them.—*Dental Luminany.*

ARTICLE V.

ARTICULATION OF ARTIFICIAL TEETH WITH A VIEW TO THEIR BETTER RETENTION IN POSITION.

DR. W. E. DRISCOLL, BEDFORD, IND.

(Read before the Indiana Dental Society.)

Stated in the fewest words, the improvement consists in securing backward pressure upon an upper set of teeth, and forward pressure upon a lower set. No one will, I suppose, question the propriety of this as applied to an upper set. At first view, its application to a lower set seems more open to objection. Press the lower set forward and we utilize the only approach to a rim that can be left to many lower sets, that between the jaws under the molar teeth. Forward pressure makes this rim fit firmly to this part of the gum. A failure to do so is a matter of common complaint with those learning to wear artificial teeth. Such close fitting will produce soreness at first, but in time the parts will toughen the same as any other part of the gums.

How are we to secure the backward pressure upon upper sets and forward pressure on lower sets at the same time? It must be done by elevating the line of articulation at the front teeth as much as can be done with lower teeth extremely short, from the pins to the grinding surfaces of the molars. Teeth must be selected with this object in view, or the plan can not be carried to a successful issue.

Very often, four bicuspids must be left off to shorten the sets so they will allow the necessary depressions upon the posterior portion of the gums. When setting up the teeth, leave a space between the front teeth that will allow an ordinary thickness of blotting paper to pass between their cutting edges when the molars are firmly set on their grinding surfaces. After a few days or weeks wear, the front teeth will be found striking together freely as hard as is desirable, if not so much so as to require some grinding to again throw the main pressure upon the back teeth. The outside and inside cusps of the molars, above and below, must be on an exact level—outside ones no higher than the lingual or palatal ones. When an extreme degree of absorption has taken place, the superior molars will extend near an inch from the upper gums. But let no one hesitate to try them in that way, and the result will be a surprise. Where the inferior alveola is practically absent, care must be taken to set the six front teeth fully as far backward as the ridge should be, and in extremely discouraging cases it will at times be best to set these six teeth a little inside of where the ridge has been. This will, in some cases, leave the upper front teeth standing much more prominent or outside of the line of the lower ones. If this can not be remedied by setting the upper teeth under the gums without interfering with the upward slant of the line of articulation, then the hiatus must be endured, and in many mouths it will be found to amount to no real objection upon trial.

In cases where the short appearance of the upper front teeth would be an objection, an off-set may be made between the molars and bicuspids of each set that will secure or produce the desired backward pressure upon the upper set without the upward slant extending so far forward. This off-set may also be used where there is not room between the ridges to get the amount of dip necessary to a practical result; or to get the upper front teeth to show as desired.

The upper slant of the line of articulation might terminate at the first bicuspids; but this will not be found necessary, as a rule, and in some cases would defeat the attempt to induce the patient to wear teeth at all.

Where a portion of the lower natural teeth are retained, all points of articulation that have a tendency to press the upper plate forward, must be avoided, and all available points to construct slanting surfaces that will result in backward pressure upon the plate must be used. Sometimes this can be done by setting a tooth on each side, so as to receive a glancing stroke from the lower teeth, or prominences of the material of which the plate is made may be so placed as to shut down behind a posterior lower tooth on each side. Sometimes several of the molars are very much elevated above a plane with the teeth anterior to them, and have a very decided tendency to press an upper set out of the mouth. Such teeth, when leaning forward, must not be allowed to strike the upper teeth with their grinding surfaces; but to utilize them in keeping the plate in position, prominences of plate material must extend downward behind them, presenting an inclined plane for them to strike against, that will press the plate backward. Patients may object to these prominences, slanting strokes, etc., at first, but when they realize their value there will be an end to objections.

Some critics may say this plan will require teeth to be made without regard to their natural appearance, or the restoration of sunken features, etc. Not so, if rightly understood and practiced. Although the points of contact of the opposite sets of teeth may be too far inward to restore the expression, this may be counterbalanced by additional material in the rims. And with a full rim and teeth, set well inward, the lips may and do take hold upon these rims and aid to retain them in their place. Very often teeth, instead of being assisted in this way to retain their place upon the gums, are forced from their position by the action of the lips and cheeks.

An accurate bite is necessary when these slanting surfaces and prominences are used in articulating teeth. To secure this, I have an improvement upon the plan mentioned two years ago. When the wax is placed between the gums, direct the patient to swallow at the same moment that the jaws close toward each other. This plan is so satisfactory as to leave nothing to be desired further in that particular. If a hard substance is embedded in the wax to arrest the closure of the jaws at the right distance from each other, the gum will generally be flattened at that point. So when the models are placed in the bite, the flattened points in the bite must be cut out that the models may go accurately to their proper positions.

In constructing teeth upon the cheap bases, I do not hesitate to say that all trying teeth in the mouth after grinding up and before being finished for use, is worse than useless. There can be no dependence in the way a patient will close the mouth with a loose lot of gutta-percha therein. The length of the teeth, the fullness of the rims, and everything desirable to know can be ascertained by means so much more simple and practical that I do not consider it worth while to go into a description of them.—*Items of Interest.*

EDITORIAL, ETC.

A DENTIST INTERVIEWED.—An amusing account of an alleged interview between the reporter of a prominent paper and a dentist has recently been published, the non-advertising portion of which we give as follows :

The dentist talked while he worked.

"Of course I study faces," he said, "and I flatter myself that I can read them fairly well, too I am seldom mistaken in my estimate of a patient. Frequently I can tell a man's business before I have him in the chair five minutes. It is one of the delights of my profession. Take your own case, if you'll excuse my personal. Before I had got this tooth half filled I concluded that you are a Southerner and a school teacher. Am I right? No, no; don't move your head? I am seldom wrong. Had a brother a school teacher once. He died. Take the ladies, for instance. I can tell without exchanging a word whether a woman comes here meaning to get the work done at any reasonable cost, or whether she is inclined to higgle over prices. I can guess at a glance whether a patient is going to be troublesome and cross or not. Now I am going to hurt you."

The little wheel whizzed around like a buzz saw, the patient tried in vain to suppress a groan, and the dentist ceased talking. Soon he began again.

"I was going to tell you that the young ladies exhibit more pluck in the chair than the men do. They are not so impatient, for one thing, and they don't like to show any evidence of timidity. Some of them make rather curious requests sometimes, and I have to be very careful about humoring them. I was examining a young lady's teeth yesterday. 'Oh, won't you please hold my hand,' she said, 'it will give me much confidence.' To be sure I didn't do it. I have been in the business long enough to be discreet. Some of these artful creatures seem to do everything in their power to drive a young dentist to distraction. After fighting one blackmail suit in the courts, I am cautious. At a signal from me two ladies will sit on that sofa doing fancy work, and the double doors are arranged so that they can see everything which goes on in this room. After a New York girl has been to a dentist once and got confidence in him, she never thinks of bringing her sister or her mamma with her again. Bashful, timid girls from the country always bring three or four relatives with them, who invariably get impatient and hinder me in my work. Elderly women, especially single ones, are the most suspicious patients to deal with. They want to know the why and wherefore of every detail, and they always affect astonishment at the price. A few days since one of them wanted a set of upper teeth made.

"How much will you charge?" she asked.

"I told her $45."

"Gracious" she said, "I thought I could get top and bottom for $12.

"I thought that she might possibly be in poor circumstances, and did the work for her very cheap.' I have since learned that she could buy and sell me out four times over, and that she gave me a fictitious name. Another trouble with the women is in getting them to pay for broken appointments. Any trifling thing, a caller, or an hour's extra sleep, will cause them to miss an engagement I have set aside for them, or come late. Then they make a wretched fuss on being asked to pay for time unnecessarily squandered. Exceptional cases, either bereavement or sickness, are, of course, allowed for."

"Business men are the hardest fellows to deal with. They want us to do everything with a down-town rush. The operation is put off and put off again until a cold snap or a drink of ice water hurries matters a little. I have frequently to make evening and Sunday engagements for rich men who will not spare any other time from their business. They pay extra prices. I had a young broker come in here once to have two back teeth filled, I had hardly begun work when he called for a hand glass."

"Oh, never mind," he said. "I can't wait. Those fellows won't show. Take 'em out."

"I remonstrated, but he insisted. When they were out he was angry. That same man will fritter away a couple of hours over his lunch every day. Another thing, I find that with all patients the surroundings go for a great deal. They like a cheerful place. I had an office once which faced the kitchen of a big hotel The chair must be near the window. All day long the room was filled with the aroma from the flesh-pots and the noisy jargon of the scullions. It made the ladies fretful, and—excuse me.

The dentist answered the bell and his patient lifted his head from the torture rack and looked around the office. Everything had obviously been arranged to please the eye. The operating chair was drawn close to a window overlooking a model back yard exuberant with foliage and fragrant with flowers. Canary birds chirped and twittered in their cages, goldfish chased one another among floating vines in a big aquarium. There were no gewgaws stuck around on the shelves. The books on the table and the pictures on the wall had evidently been chosen with care. Almost unconsciously one felt quite at home. The dentist returned and was asked this question:

"Why is it that so many dentists are without the modern appliances for extracting teeth? They seem to have ignored that branch of the business."

The dentist continued his work and his conversation. "Our business is to save teeth, not to pull them out," he said. "It does not pay many of us to bother with extracting. That work seems to have fallen into the hands of dentists who do nothing else. I does not require much knowledge—though sometimes considerable muscle—to pull a tooth. Barbers used to do it. In England to-day people run to apothecaries to have teeth drawn. Dentistry has now become one of the fine arts. If a tooth is too far gone to be filled we clip away the edges and put in a porcelain one on a pivot, so that you could hardly tell the difference. Gold and silver is now made much more suitable for our purpose than it used to be. The gold is of better quality, softer, and more easily worked. A few years ago 'building' a tooth, as is now commonly practiced, would have been a difficult; and, in some cases, impossible job. Big operations bring big prices. Some New York dentists get apparently fabulous prices for their work, but I suppose skilled labor is worth what it will bring in the market. There are dentists who will easily average $40,000 a year. The majority of them, though, earn anywhere from $2,000 to $7,000 a year. Of course I am speaking only of graduates of some dental college and members of one of the local associations. I do not include certificate dentists."

"What do you mean by certificate dentists?"

"Well, quacks. In 1879 a law was passed requiring all dentists who should hereafter be admitted to practice to be regular graduates of some dental college. But all non-graduates who were at that time practicing under certificates were allowed to continue. You will see them scattered all through the city doing work at cut-throat rates. The regulars, of course, don't recognize them, and personally I have no knowledge how much they earn."

"How is a poor mortal suffering with the toothache to distinguish a graduate from a certificate man?"

"Easily enough. The college men are entitled to prefix 'Dr.' to their names. The other fellows are not. It is simply 'John Smith, Dentist."

SKIN GRAFTING AND RHINOPLASTY.—Thomas Colt has recently been discharged from Bellevue Hospital with a restored nose. He was deprived of his nose a number of years ago by a cancerous affection technically called lupus, which destroyed the nasal bone as well as the fleshy covering, and even the lower eyelids. His treatment was undertaken over ten years ago by Dr. Thomas Sabine, the Professor of Anatomy of the College of Physicians and Surgeons, and has been successfully pursued up to the present time. Dr. Sabine first addressed himself to the task of arresting the disease, and when that was accomplished he restored the lost eyelids by grafting thereon healthy skin taken from the cheeks and forehead of the patient. The more difficult operation of restoring the nose followed. This was done by making use of the third finger of the left hand, from which the nail was first removed by nitric acid. Then the end of the finger was fixed against the forehead between the eyes, the epidermis at the points of contact having been previously removed to bring about adhession. At the same time the finger up to the second joint was split open on the under side, the flesh stripped off, and the flaps thereby produced were connected with the flesh of the cheek on either side. The hand was fixed in the proper position by plaster of Paris and held so until the adhesion was comcomplete. Then the finger was amputated at the second joint, and the free edges of the part adhering to the face were arranged so as to form the wings of the nostrils. During all this time the nasal orifice was kept open by a hard rubber tube. The treatment necessarily occupied much time, and involved a number of painful operations, but was completely successful, and it is almost impossible now to distinguish the nose thus fashioned by surgical skill from one cast in nature's own mold.

MONTHLY SUMMARY.

HOW TO MAKE A PERFECT FITTING PLATE.—In the course of our professional life it is a good plan to pause now and then to re-examine our accepted methods and see if perchance they may be improved. Mankind are very prone to accept that which is, as being all that is needed. All this looking ahead to discover new fields, new ideas, and new methods is well enough, and leads to progress. For the present we will leave that to others and spend a few moments in examining present methods, as some times real progress is not made because of imperfections in present methods, which must be the foundation upon which future progress will have to be based.

It has been, and is now, the custom to make air chambers in upper plates; the object of which is the better retention of said plates in the mouth. It is evident that the plate is held in position by the pressure of the atmosphere upon one side of it, the air being pressed out from the other side by the exact coaptation of the surface of the plate to the surface of the mouth, the pressure being just in proportion to the surperfices of the plate. Now I am utterly at a loss, when I seek for a law of natural philosophy that causes a plate to adhere with greater firmness, when it has an air chamber under it, of even one tenth its superficial area. The natural tendency of such an air chamber must be to reduce the pressure. If the pressure is too great, then an air chamber may be of benefit in reducing the pressure. I have, however, never heard any one claim that the pressure would be too great. My observation has been that in soft mouths the cauity becomes entirely filled by the soft tissue—this is caused by the greater pressure upon the surrounding tissues—thus forcing them into the cavity, and producing congestion and inflammation, and thereby becoming an instrument of torture, rather than an aid to the better retention of the plate. Believing them to be of no advantage whatever, I have discarded air chambers entirely, both in hard and soft mouths, and have found my work gives better satisfaction than when I followed the beaten path. I never yet have found a brother practitioner who could give a better reason for their use than that the authorities all recommended them. Try the following experiments:

Take two pieces of smooth glass of eqeal size, moisture them and press them together, and notice the tenacity with which they adhere to each other. Then grind a cavity in one of them, proportioned to the size of the glass, as the air chamber is to the plate; press them together in the same manner, and see if they adhere with greater tenacity then before. If they do not, then the reason usually given for the use of air chambers be relegated to the museum of things of the past which mark as stepping stones, our progress. During the past seven years I have tried all the various methods of fitting plates that have come to my notice, and as a result of such experimentation have adopted the following method, which at least has given good results in all cases where the patient had teeth articulated over the whole grinding surface of the molars. If my method affords the same aid to others that it has to me, I shall feel amply repaid for represent it to you to-day.

We all know that plaster, if used with water alone, will warp more or less, and a misfit of greater or less degree is the result. I have tried various means to avoid warping. I now use one and a half teaspoonsful of potash alum to the pint of water and use the solution in mixing plaster. I use this solution in all my processes with plaster and find it answers a good purpose. In taking impressions I use plaster as thick as I can work it, and in taking the second impression for the model, I mix it just thin enough to run into and fill perfectly the impressions made in the first cast. I believe the secret of working plaster so as to avoid warping lies in stirring the mixture as little as possible, and using it as stiff as will allow of a clear and perfect impression. After taking the first impression, take a wax-knife or large spoon excavator, and scrape the impression, from the maxillary tuberiosity on the left, around the alveolar process to the maxillary tuberosity on the right, about the thickness of heavy writing paper. Then scrape over the incisive foramen, along the palate process of superior maxilla and of the palate, to the posterior nasal spine. By feeling in the mouth with the fingers you will ascertain the distance to the hard surfaces connected with these parts. All the hard surface must be scraped. The amount of scraping to be done will be determined by the character of soft tissue. If very soft, scrape the thickness of blotting paper; if hard, the thickness of thin writing paper will be sufficient. Now, place the impression in water, and saturate it, using neither varnish nor oil. Mix a little Spanish brown with your plaster, to change the color, so that you can tell when you cut down to the model. By the difference in color you will find the separate as good as when varnish and oil have have been used. As soon as you have your model ready, turn it over and scrape it on both sides of the palate process over the posterior palatine foramen and groove anteriorly about one-half inch and to the edge of the alveolar process. It needs to be scraped so that it will bear hard upon the soft tissues. Some mouths require as much as one tenth of an inch. By means of this scraping your plate will rest hard upon soft tissues and after a few days wearing will bear upon the hard tissues equally, thus preventing the rocking and falling down of the plate. I sometimes scrape the model under the lips and next to the cheeks so that it may press firmly at these points.

In the lower plate, after the impression, I scrape the bottom of the impression, when the teeth have been long extracted, about the thickness of No, 60 tin foil, and after I get my model I scrape the labial, buccal and lingual surfaces about the thickness of thin writing paper. When about to take the bite, I say nothing to the patient of my intentions, but place my wax plates in the mouth and order the mouth closed, and at the same direct them to perform the act of deglutition; at that instant I press the wax together. After the bite is made and wax removed from the mouth, I have the patient push the chin forward and bite, then draw the chin back and bite again; by doing this, I am enabled to tell, when I get the model in the articulator, whether the bite is correct or not.

By following this plan, I have only had two wrong bites in the past five years. In articulating the teeth, I set them as far under the ridge as possible. If gum teeth will not go under, I substitute plain teeth, and will rather sacrifice the beauty of a joint at the bicuspids and molars, than not have them go under the ridge. The leverage must be overcome, and I know of no better way than to set the teeth under and as near where the natural teeth were as possible, and I consider it far better to use plain teeth as bicuspids and molars than to let the teeth project from the ridge. I use plain teeth with pink rubber for gums, when the patient will consent, and thereby make the teeth more serviceable in masticating food. Gum teeth are well enough in their place, but I would dispense with them entirely if permitted. They remind one of soldiers on dress parade, and cause too great a similiarity of expression.

In grinding the teeth on the model, for old people, I grind off the cusps of the bicuspids and molars slightly, and also square the front teeth to make them look as if worn by age. I make them articulate so that the back teeth will strike first and leave a space the thickness of blotting paper between the front teeth. After they are worn a few days you will find them close together, and the front blocks will not be crowded off the plate. I am confident that if you will try this plan, you will be pleased with the results, and your patients will meet you with a smile instead of that care-worn and discouraged look so often seen.—*Archives of Dentistry.*

ANTISEPTIC ABSORBENT SPONGE.—Mr. Sampson Gamgee showed before the Medical Society of London, April 21st, an artificial antiseptic sponge of his invention. A small capsule, containining eucalyptus or other antiseptic, was enclosed in absorbent cotton; outside of this was a layer of cocoanut fibre, and outside of this more absorbent cotton-wool; the whole being enclosed in gauze. When about to be used the capsule could be broken by a blow of the fist, and the absorbent cotton became permeated with the antiseptic. He said these sponges could be made at a very trifling cost, and hoped they would come into use as a cheap substitute for ordinary sponges; they possessed this great advantage, that when required for use they were certain—however long they might have been kept—to be antiseptic: and, being so cheap.

they might always be destroyed after being used.—*Canada Medical and Surgical Journal.*

TREATMENT OF EPISTAXIS.—An ingenious application of the condom in the treatment of epistaxis was suggested by the late Prof. McDowell. For the purpose of arresting the hemorrhage the condom is tied to the end of a small flexible catheter and a piece of rubber tubing, with a clamp, connected with the catheter. The condom is then lubricated and introduced into the nostril from which the bleeding proceeds, and when in place inflate with air or water as desired.

CHLORAL HYDRATE AS A VESICANT.—It is stated that powdered chloral hydrate, sprinkled upon adhesive plaster which is then sufficiently heated to cause it to adhere to the skin, and immediately applied to the surface where a blister is desired, will as effectually accomplish the purpose in ten minutes as a cantharidal plaster will in six hours. The pain produced by it is but slight.

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ARTICLE I.

THE ORIGIN OF DEFECTIVE ENAMEL.—Continued.

BY PROF. W. H. EAMES, D. D. S.

Discussion.

Opened by Dr. L. C. Ingersoll, of Keokuk, Iowa:

The subject presented by Professor Eames in his very able and excellent paper is too large to be entirely compassed in a discussion on an occasion like this. I can, therefore, but barely allude to several of his points, and pass on to the discussion of the main question, to account for the appearance of horizontal grooves and lines of pits on the labial, and sometimes on the lingual faces of the teeth also—including those cases where a succession of parallel grooves appear. Imperfect development of enamel, appearing in single spots, pits or wells in various locations on the teeth. I am willing to concede to congenital or pre-natal causes; for by the death or atrophy of a single cell, or a group of enamel cells, imperfect enamel would result. I shall not deny that suspended development may occur in the organs of tooth development, as in various other organs and tissues of the body—dwarfed limbs, missing toes, fingers, bones and teeth and other deformities are ample proof of this.

Dr. Eames is ingenious in his theory, and, in accordance with it, is able to account for some of the phenomena in question. But I do not see how he can account for the markings on first molars and bicuspids, nor for all the peculiarities of defect appearing in the enamel of the incisors. My object, however, is not so much to oppose him as to oppose the commonly accepted theory; and to establish another which, in my judgment, will sufficiently account for all observed cases. In this we agree, that the old theory is wrong; and I am glad to find so efficient a helper as Professor Eames in the overthrow of a theory so univeraally held by the profession, supported by the teachings of all our dental literature for more than a hundred years. Yet I am constrained to say that I have no idea that the repeated announcement of an acquiescence in the theory, as announced by Bourdet in 1757, is the result of repeated investigations and demonstrations of its truth. But when the theory of arrested development was once announced, the authority of the man, without demonstration, was sufficient to give it credence. So great was its plausibility that demonstration was not demanded, and in the absence of all other ætiological account concerning it, the theory of suspended development has met with universal acceptance, although to-day it remains, so far as I know, without a single valid argument to support it. The flimsiest evidence of its truth has been received as valid. Let us look at some of these so-called evidences. It is said that the teeth, hair, and nails, having the same histological origin, each alike, shows, at least in some cases, the effect of suspended development so apparent in the teeth, and, at the same time. A brief consideration will show the falsity of such assumptions. It is estimated that the life of nail cells is from four to five months, being less in summer than in winter. The nails being of perpetual growth, all markings of any sort on the nails would be obliterated in a period of a few months. How is it possible, then, that three years after the time when the teeth exhibit their markings similiar markings can be seen on the nails?

How is it, now, about the markings on the hair? Somebody in the long past, looking through his microscope, saw the imbricated condition of the surface, and at once pronounced it a case of suspended development, the same as appears on the teeth. If he had examined the hairs from a hundred heads, and from the bodies of the domestic animals, he would have found the evidence of measles or small-pox in every case. The structure of the human hair, as modern histological science gives it to us, is thus: [Blackboard illustration.] The hair of the cat is represented as a series of truncated cones, thus: [Blackboard illustration.] This imbricated condition, like the overlaping of shingles on a roof, is supposed to represent a period of suspended development.

About forty years ago there was published in New York a small work, giving an account of the formation and development of the teeth, and of various diseases to which they are subject. In this work the author introduces another illustration of suspended development, with results similar to those found on the teeth. The case was that of a cow's horn. He found it with alternating ridges and grooves, which he pronounced the result of faulty nutrition and arrested development. This went, so far as I know, as unquestioned an illustration as nails and hair. Suppose some doubter had ventured to ask the author, "How is it that these ridges and grooves never appear till after the animal is three years old?" The only wise answer he could have given and supported his theory would have been, that bovines never *suspend* till after they are three years old. Let us now, for a moment, look at the structure of a horn. Its corneous layers are also imbricated. Up to the third year the outer layer is continuous, from the tip to the skull. During the fourth year it runs out at the surface, and underneath its terminal edge is seen another layer. And thus, each succeeding year, is brought to view the terminal edge of one of the layers, and between these terminal edges is presented, from year to year, an additional groove.

The strongest and most reliable argument of all is of a historical character—"the mother of the child told me so." It is alleged that, in a large number of cases, in regard to which investigation has been made, the mothers and nurses have confirmed the theory of the investigator that, at the period when certain teeth were receiving their amelification, the child was afflicted with a severe constitutional disease.

You may fix any period during the first five years of the child's life—the years in which the teeth are in the process of amelification—and ask the mother, "Did not your child, at that time or during that year, have some constitutional disease?" and she will be compelled, in nearly every instance, to say "yes;" and that, too, not alone of the child whose teeth are pitted or otherwise marked, but of every child of her's. For see the long list of diseases to which children are subject at that period of life: Measles, whooping cough, eclampsia, scarlatina, eruptive fever, gastric fever, scalled head and a long list of exanthematous diseases. With this long catalogue of diseases on the tapis of childhood, it is scarcely possible for an enfeebled child to pass a single year and escape all. Hence, any mother could truthfully respond in the affirmative as to the happening of some constitutional disease during any assumed period that a professional man might name. I say *assumed* period; for with the known variation in the time of development of the teeth of different children, all is guess-work as to the particular stage of development of any child's teeth before they have emerged from the gum. Yet we are told by the wisest men of our land, and of all lands in the science of dentology, that these markings on the the teeth enable the dentist to tell, with considerable accuracy, the period when there was some constitutional disturbance. This is the same kind of accuracy with which Professor Tice predicted the weather. Turn over the pages of his almanac and you will find, at some specified date, "*Rain in places.*" So, if there is rain on that day any where on the face of the earth, he evokes all his thermal wisdom and astronomical science to declare that there must have been, at that time, "some *ærial* disturbance;" and when there is any ærial disturbance, there may be rain in places.

Now, how is it as to the testimony of mothers concerning the new doctrine, that these markings on the enamel occur *after* the teeth have cut the gum, and are brought about by chemical decomposition? *All* the diseases incident to childhood do not occur previous to five years of age. Several of the diseases named are quite as common an affliction between the ages of five and ten as between one and five. I have often asked mothers, when I have been consulted concerning this peculiar condition of the teeth of their children. Did not your child, at the time when these teeth were emerging, have some severe disease which involved the mucous membrane of the mouth? And I invariable get an affirmative answer. Thus far the testimony on both sides is equal, and therefore no proof of *either* theory.

Should I now get the testimony of observation and demonstration—which is not possible, or, if possible, has never been attempted concerning the old theory, but which is possible, and has actually been obtained concerning the new theory—according to the amount of this testimony the new theory is established. [A case related.]

Now let us scrutinize the accepted theory a little more closely. It is this, that at an early period in life, while the enamel is in the process of formation, a line of enamel cells, extending horizontally along the labial portion of the tooth, and, in some cases, completely encircling the crown, suspend the process of amelification, which is plainly marked on the fully emerged crown by a groove or by irregularly formed pits at intervals in the same line.

The deposit of enamel, as has been stated by Professor Eames in his former paper, is in one continuous sheet over the entire cap ot dentine. Why then should there be suspension only in a particular line of cells running horizontally? Why not just as often running vertically? Or why not a suspension of the developmental work of all the ameoloblasts of the enamel organ? Still further, why should we not expect to find the odontoblasts as well as the ameoloblasts affected in a similar manner, and thus find a groove or rather a hollow tube, as it must necessarily be, in the solid dentine entirely encircling the crown in some instances, opposite the groove on the enamel? Why are the markings sometimes on the labial faces and not on the lingual? Now, let us for a moment look at the most puzzling of all questions pertaining to the accepted theory, and that is to account for the appearance of *parallel* grooves at regular intervals, numbering, in some cases, five or six. The reasons sometimes offered are ludicrous, and if carried out to the full limit of their application they appear ridiculous in the extreme. One author, to whom I have alluded, introducing a goose quill for illustration—a quill having rings around the barrel of the quill, constricting it, at intervals as though threads had been tied around it and checked its filling out at these points to its full size—says that these rings, indicating suspended nutrition and develment, were probably caused by irregular feeding. At one time the farmer's corn gave out, and the goose almost starved; then again the fowl would have a full supply, and became sick and lose its appetite from overfeeding, which would result in another ring. Then, in accounting for the alternate rings and grooves on a cow's horn, he says they indicate the change of nutrition on the recurrence of summer and winter. In the Summer the animal is fat and sleek and well nourished, and the whole body develops symmetrically; but in winter the animal's food is changed—has no relish for the dry food, and perhaps is poorly sheltered and cared for, and this causes a suspended development in the horns, and probably in the hoofs too.

Now, what does the dentist say concerning the teeth? In accordance with the accepted theory he says: at this point of amelification the child had scarlatina; at that point whooping cough, when another groove was formed; at the next point small pox; at the next point eclampsia; and so on, through the list of constitution ailments of children that interrupt nutrition. And where it is observed that these grooves occur, in some cases, at regular distances from each others, all that he can say, in accounting for it, is that the child began with fits, and in exactly two months after he had an eruption fever; and in exactly two months after that he had small pox; and at regular intervals thereafter he had some other exanthematous disease, and wound up with a relapse of all he had gone through with before, which produced a suspension of development and a loss of enamel over a wide area. If there is anywhere to be found in ætiology anything more ridiculous than this, I should like to have it shown.

Now, if it is possible for you to disabused your minds of so erroneous a theory, after cherishing it long, you will be prepared to consider another theory and to mark its coincidence with well-known facts. The statement of the new theory is this, that these markings do not occur during the follicular development, but are the result of chemical action occuring after the development of the crown and after its emergence through the gum. The fact of the erosion of the enamel at the margin of the gums, in the form of a groove, is one of universal observation. It may be considered an accepted fact that a horizontal groove or line may thus be produced along the labial or buccal face of a tooth, and also, as sometimes seen, on the lingual faces. This dissolving of the enamel, in a horizontal line at the margin of the gum, may occur at any period during the emergence of the crown —at the time when the point of a cuspid has just made its appearance, or when half the crown is seen; in the latter case the marking will appear on the fully developed tooth, midway between the point of the cusp and the margin of the gum. The case is not now fully explained until we account for the appearance, at regular intervals, of grooves alternating with ridges.

I saw this difficulty some years ago, in attempting to establish the theory, and discovered, as I think, a full explanation in the physiological law that govern both plant and animal development, and that is the law of alternate vital action; in other words, that *active* development, alternates with *arrested* development. Illustrations are both ample and evident throughout the body, and are apparent everywhere in animate nature. Look out now upon the maples, and you will see a case of suspended development; the leaf buds of last year have fully unfolded; the leaf has expanded to its full size; you will see no more development at the top of the tree, possible, for two or three weeks. Is has suspended development at the ends of the branches, and is developing in some other part of the tree. After a period of arrested development at the top, you will see a renewal of development and the tree will be covered with a fresh growth of light colored, yellowish-green foliage. Look at the peach tree, to which I cannot point you this year, and when the petals of its blossom fall, the fruit germ will, in two or three days have gained the size of a pea, and soon after that of a cherry, and rapidly reach the size of a robin's egg, then suspend, and make no more increase in size for weeks. But this whole tree does not suspend; it is developing in some other part, the stone which was before pulpy, is now hardening; each part alternates with some other part.

Arrested development may, therefore, be shown to be a physiological law, and as such to prove the fallacy of assuming that arrested development implies constitutional disease and impairment of tissue. Because, under the physiological law, when the development processes are for a while suspended, the tissues do not suffer impairment by reason of the suspension. Nature takes up the work where she left off and the tissue is perfect throughout. Every part of the human body has its alternating part—the brain alternates in its development with the cranium; the intestinal canal with the abdominal walls; the teeth with the surrounding tissue, the alveolar walls; the ameloblasts with the odontoblasts,—they are counterparts of each other.

The working out of this law is one of the economics of nature. The elements of bodily growth are obtained through the nutrient system. If it was required that all parts of the body should develop uniformly and at the same time, it would be impossibly for the nutrient system to supply all the elements. If all the hard tissue of the body developed equally, n the same period of time, it would be an utter impossibility, in the nature of things, to obtain in food the amount of lime salts which would be required. This fact shows the economy of nature in the law of alternate vital action. Were there never any functional disturbances caused by disease, the body would develop under this law in the same perfect symmetry as we might presume that it would under a system of uniform and uninterrupted development. This law of alternate development explains the incomplete formation of tissue, in cases of congenital hernia. In the alteration between the intestinal canal and the abdominal walls, the functions employed in the development of the latter may not keep pace with the intestinal development, caused by some functional weakness at the period when development should have been normally active in the abdominal tissue. We are often called to observe the want of harmony between the teeth and the jaws—the teeth are too large for the jaws, or the jaws are too large for the teeth. This occurs because, at the period when the vital forces were employed in the development of the one or the other of these tissue, either there was a deficiency in the supply of lime salts or a deficient in the power of assimilation.

Now, we are prepared to consider the alternation of grooves and ridges on the teeth. It must have been observed by some of you, at least, that investigators, concerning different organs of the body, have found it not only convenient, but necessary, so far as their observations concerning the teeth are concerned, if they would note decided changes and progress, to make their observations bi-monthly. This circumstance points to the fact that their alternating period of development returns about once in two months. This conforms, also, to the periods laid down in our books, as usually observed concerning the emergence of the teeth: a new tooth appearing about once in two months; the centrals of the deciduous set at about the seventh month; laterals at about the ninth month; then the molars appearing successively in the 24th, 26th, 28th and 30th months. This by-monthly development pertains not simply to the period of cutting, but also to the period of progress, on to the full development and normal position of the teeth in the jaws. Now, we are in possession of all the facts, individually considered, and necessary to the production of the peculiar pathological condition under consideration: *First fact*—an acrid fluid developed at the margins of the gum which, in its nascent state, is an active solvent of enamel; *Second Fact*—a *periodic* active development of the teeth, during which the tooth rapidly emerges, alternating with a periodic cessation of development, during which the tooth crown does not advance. The first fact may be the result of gastritis or a general febrile condition, whether associated with exanthematous disease or not. A diagnosis need not go beyond the inflammation of the mucous tissue of the mouth. Suppose, now, this occurs at the developmental period of from five to ten years of age, and is active at the alternating period of cessation of development, a horizontal groove must inevitable be the result. This period of cessation is followed, according to a law of nature, by a period of rapid development and emergence of the tooth crown from the gum. During this period there is no portion of the enamel sufficiently long in contact with the margin of the gum, where this erosive agent is working, to seriously effect the enamel. But if the diseased condition remains for several months through a summer season, as it sometimes does, when the next periodic cessation of development occurs, whether it is in exactly two months or three months, it matters not; at that period another groove will be formed, and the number of the grooves will correspond with the number of periods when there was a cessation of advance of the tooth towards the full exposure of the crown.

ARTICLE II.

TIN AND GOLD COMBINED AS A FILLING MATERIAL ELECTRICALLY AND PRACTICALLY CONSIDERED.

BY W. D. MILLER, OF BERLIN.

It is not known who first ventured to use a combination of tin and gold for filling teeth. About 18 years ago a gentleman called upon Dr. Abbott, of Berlin, to have his teeth examined. In one of them Dr. Abbott found a discolored filling, having the appearance of amalgam, and remarked that it was the best amalgam filling he had ever seen, to which it was replied that the filling consisted not of amalgam, but of a mixture of tin and gold foils. Since that time Dr. Abbott has used this filling material in his practice very extensively, and in former years strongly recommended it to the profession. It has, however, been adopted by only a limited number, owing, no doubt, in part to the prevalence of a wide-spread superstition that the electricity attendant upon such a filling will in some way or other be injurious to the teeth. The electrical conditions connected with a filling of this nature can be understood only when the arrangement of the two materials in the filling is perfectly appreciated. The material is prepared by laying from 1-6 to 1-3 of a sheet of No. 4 non-cohesive (Abbey) gold foil upon a similar strip of No. 4 tin foil, and twisting between the fingers into a soft crumpled roll.

It is immaterial whether the tin or the gold is on the outside. Some prefer the former; others the latter. Frequently both materials appear on the surface, something like a barber's pole. These rolls are worked in the same manner as strips of non-cohesive foil, or they may be cut into pelets and worked as non-cohesive cylinders. It follows from his method of preparing the material that the two elements, tin and gold, must be pretty evenly distributed throughout the mass.

There result accordingly upon the surface of such a filling an indefinite number of indefinitely small electric currents flowing in all directions. Since, however, it could happen only by chance that a very great excess of those currents would be directed towards the margin or surface of the cavity, it is not possible to see how any action, either upon the hard tissue of the tooth or upon the pulp, could result from them. We will find a definite negative solution of this question further on.

A question which has given rise to some discussion in America is that regarding the influence which the tin is said to have upon the supposed electrical condition of the tooth itself. We have been told that by lining the walls of the cavity with tin, "the tin being electro-positive, makes the tooth electro-negative, and therefore the tooth is guarded rom injury from acids." This explanation is very short, but nevertheless involves some very considerable errors:

First. The supposition that the tin must be placed on the outside to insure success is not in accordance with the facts; it is quite immaterial which is outside; in fact, Dr. Jenkins, who next to Dr. Abbot has had more experience in this matter than any other living man, always folds his rolls with the gold outside.

Second. The tooth being a non-conductor cannot receive a potential, either positive or negative, by mere contact with a metal. This point I established some years ago so clearly that even those of contrary persuasion could offer no other objection than that my experiments were made with normal dentine, and that carious (delacified) dentine would have given other results because of the electric current between the metal and the organic portion of the tooth. Even this objection is, however, merely fanciful, because the dentine used in my experiments, though normal at the very beginning of the experiment, was not so five minutes later, and at no subsequent moment during the whole course of the experiment, on account of the decalcification produced by the acid solution in which it was immersed.

Third. Granted that an electric element *could* be produced by the contact of gold with tooth-bone in the fluids of the mouth, the electro motive force of such an element would not be changed in the slightest degree by interposing tin between the gold and dentine, the difference of potential between any two conductors being independent of the number of conductors which may be interposed between them. For example, in each of the following series, the difference of potential between gold and dentine would be the same: 1) gold-dentine: 2) gold-tin-dentine: 3) tin-gold-dentine: 4) gold-tin-copper-zinc-etc., etc., etc. dentine. Consequently by interposing tin between the gold and dentine we would not prevent or reverse the current; we would only increase to a certain slight extent the resistance of the cell. We would, however, obtain a second current (between the tin and gold.)

As for the first and second current (between gold and dentine, and between tin and dentine,) whether they would flow in the same or in opposite directions we do not know; the supposition that the dentine is electro-negative to tin and electro-positive to gold, being by no means entitled to the dignity of an established fact.

The explanation offered above is conseqnently faulty. First, because it presupposes a state of things different from that which really obtains; second, because to account for this supposed state of things, it assumes an electrical condition of the tooth which has been proven not to exist; third, because to conclusions given as the result of this assumed electrical condition are not based strictly upon facts, either experimental or theroretical.

Since I have been in the practice of dentistry I have made over one thousand fillings of tg,* and have had the opportunity of observing at least as many more, partly made with the tin next the walls, partly with the gold next the walls, partly mixed, many also begun with tg and finished with gold alone; I have not been able to detect the slightest difference in the result, and cannot say that one method is better than the other. This is also the testimony of others who have used the material much longer than I have.

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*I use the symbol tg to denote a combination filling of tin and gold.

Again, the combining of tin and gold in one filling has in my practice had no effect upon the dental pulp. It is stated in text-books that it is bad practice to begin a filling with one metal and finish with another, that an operation is likely to be followed by disastrous results, etc.; this, for all combinations of tin and gold, is not the case.

It is my practice to begin *all* fillings in large cavities, where the structure is poor or the dentine soft and sensitive, or where it is impossible to get a strong, sound margin at the neck af the tooth. or to secure perfect exclusion of moisture with tg, and then build the gold directly upon this; also all inaccessible points I fill to one-third or one-half with hole cavities, on the grinding surface I fill to one-half with tg and complete with gold, and I have yet to see the first case in which the slightest disturbance of the pulp from this treatment.

We may say, therefore, that neither experimentally, theroretically, nor practically can any good or bad result be expected from the electrical action of a tg filling upon the tooth-bone; neither have we to fear a disturbance of the pulp from the use of tin and gold in any form in the same cavity. (Here, of course, no reference is made to those cases where a large gold filling in one tooth is brought into contact with a large filling of tin or amalgam in the adjoining tooth.)

We therefore, as far as the tooth is concerned, dismiss the question of electrical action altogether, and will now consider what are the qualities of tg which render it a desirable material for filling teeth.

First. It may be inserted with an ease and a rapidity scarcely equaled by any material in use. This is especially the case with shallow crown fillings. Medium-sized fillings of this class may be easily inserted in the time required to mix either amalgam or oxy-phosphate when the acid of the latter is in the form of crystals.

This property makes it particularly adapted for the treatment of the temporary teeth where the cement fillings generally prove a failure. Two minutes is abundantly sufficient for simple cavities in the temporary teeth. Again, for partially erupted teeth it may be used to a very great advantage. We often find molar teeth requiring fillings on the grinding surface when they are only half erupted.

To cut away the gum and adjust the rubber-dam and insert a gold filling would be a very long and painful operation, even if its success were sure, it would be very impolitic to subject young patients to it; cement in such cases is useless, and amalgam, to many, for various reasons, objectionable. In tg we have a material which, with no other protection against moisture than a napkin, may be inserted in from two to five minutes, and will be equally permanent with the best gold filling, and often more permanent. This brings us to another excellent quality of tg, viz:

Second. The presence of a slight amount of moisture does not at all impair the success of the filling; it is even not sure, for reasons given below, but that the filling is benefitted thereby. I have made a number of fillings, by way of experiment, completely under saliva; after a few weeks one cannot tell but that such fillings have been made with perfect seclusion of moisture. It cannot be denied that a filling material which is not injured by moisture possesses an enormous advantage over gold or cement.

This property may be well utilized in cases where it is not expedient to remove all the softened dentine, and where a complete sterilization of the cavity cannot be accomplished by a single application of the antiseptic. In this case the cavity may be thoroughly bathed in carbolic acid, or one per cent. sublimate solution, and the tg inserted without drying; or the first piece may be dipped into one of the above named antiseptics and placed in this state upon the floor of the cavity.

Third. Tg adapts itself with great readiness to the walls of the cavity, and may be used in saucer-shaped cavities where neither gold nor amalgam could be made to stay, except by means of strong retaining points or grooves.

Fourth. Tg, in the course of a few weeks after insertion, undergoes a marked change, the cause of which is not well understood; it results in a discoloration of the filling (which sometimes is but slight, and at other times amounts to complete blackness;) furthermore, in a slight expansion of the filling, thereby making it water-tight, if it was not before.

If we remove the surface from an old tg filling, we will find beneath neither tin nor gold, but a semi-crystaline mass which it is sometimes impossible to distinguish from amalgam. This change, as well as the slight expansion, appears to take place sooner in a filling which has been inserted wet than in one inserted perfectly dry. For this reason I mentioned above that such a filling might even be benefitted by a certain amount of moisture. As for the manner in which the discoloration, expansion and amalgam (?) of such fillings are brought about, a number of theories might be offered; there is little benefit, however, to be derived from a theory not properly supported by facts.

It is significant that an attempt to collect a sufficient number of old tg fillings to make a chemical study of the question did not succeed, it being exceedingly rare that a filling either becomes loose or requires renewing, whereas, as we all know, our gold fillings are failing almost daily.

To recapitulate. Tin and gold used in the manner first advocated by Dr. Abbot owes its virtues to the ease and rapidity with which it may be inserted, to its marked adaptability; to its freedom from injury by moisture, and to its slight expansion after insertion. It does not owe its any virtue to any supposed electrical action upon the tooth itself.—*Independent Practitioner.*

ARTICLE III.

THE PROMOTION OF OSSEOUS DEVELOPMENT.

BY GEORGE WATT.

[Read before the Mad River Valley Society.]

In the statement of the proposition it is taken for granted that bone may be developed, and that such development may be encouraged or promoted.

In a constitution perfectly healthy and well balanced, the bony tissues are developed exactly to the extent that they are needed; but in this proposition it seems to be taken for granted, also, that the process of development is not always well balanced. It may be easy for one constitution to develop bone while it partially fails in the development of muscular tissues. In another, the constitutional tendency may be toward the development of nervous tissue, while another runs to fibrous tissue in general.

The question now comes up—can we, in cases of badly balanced development, do anything to restore or to establish a constitutional equilibrium? All will admit that by violation of the laws of health we can do much to bring about an unbalanced state of the constitution; and it seems but reasonable that we ought to be able to do some good by a reversal of the process.

In a "one-horse-shay," and in any machine, the weakest place must stand the strain, and the way to guard against its breaking, in order that it may be honestly worn out, is to "make that place as strong as the rest." We may thus get a hint on the subject before us. If an organ or function be weakened, so that it partially fails to do its part in the economy of the system, one of two things seems to be called for: We may endeavor to render its work easy, so that it can perform it notwithstanding its debility, or we may try to arouse it to increased energy of action. Either process may, for the time, restore or establish the desired equilibrium; but the latter mode may be similar to the plan of whipping or spurring the exhausted horse. Just as in case of the horse, we must inquire whether the defect results from sluggishness, or from exhaustion. If from the former, we may stimulate, but if from the latter, we would do only mischief by such a course. We saw this plan illustrated when a boy. A shiftless man, with a team, stopped to beg a dinner for himself, and some thread to make a whip-cracker. While eating, and repairing his whip, his horses stood tightly reined, in the hot sunshine, and we were not surprised to see that he was fatter than his horses.

All tissues are formed from the blood. "For the life of the flesh is in the blood," is a physiological truth, taught by infallible authority, many long centuries before Hippocrates. Hence, whatever is to be built into the body must be passed to it through the blood. And so it follows that no tissue can be nourished unless the blood contains the materials necessary to its nutrition—the materials of which it is composed. It does not follow, however, that an organ will certainly be nourished, because the blood contains the desired nutritive principles; for it may not be able to appropriate that which is prepared and ready for it, just as a man may starve in full sight of food, because not able to take it.

It must be always borne in mind that the nutritive functions create nothing. They cannot use that which is no already formed. And let it be remembered, too, that al organic bodies are built up in strict accordance with th laws of chemical combination. Vitality modifies chemic action, but never contradicts or destroys it. It may dete mine what combinations can take place under certai circumstances, and what can not. It may prevent one, an promote another combination; but, in order to promote an the materials must be there to combine.

Furnish food for vegetables life is commonly called ma uring; and when feeding his plants, the intelligent farm tries to know what his soil contains, and what are the constituents he supplies them. An instructive case of this kind is recalled by memory. A minister of the gospel owned a farm. He called on a man, who had some reputation as a chemist, and asked him if he was prepared to analyze soils, and was told that want of time was the only lack that would prevent his giving any attention to the soil. But the chemist added—"If you tell me what is the trouble, I may help you without an analysis." "Well," said he, "it will not produce anything." "But that is a slander on your fields," said the chemist; "any field you have will bring something Can you raise straw, or corn-stalks on it?" "Why, yes," said the man, "great crops; but no grain." Knowing the land to have a sufficient of lime and magnesia, the chemist told him to give the field a dose of phosphorus, otherwise bone ashes. The remedy was tried, and a wheat crop of twenty-five bushels to the acre, followed by a crop of corn of over seventy, was the result.

The same principle governs in animal life. Just as the rootlets of the plant can not find and use from the soil that which is not there, so a tissue can not appropriate from the blood ingredients not contained in it. We have already alluded to the fact that chemical laws are not violated in the formation of living growths; and as quantity of matter is one of the modifying circumstances of affinity, it follows that when anything essential to the development of any texture is deficient in quantity in the blood, the development of that texture is promoted by furnishing it in greater proportions to the circulating fluid.

In ordinary constitutions, some essential constituents are more readily assimulated than others; and this is not more, a matter of surprise than is the fact that some foods are digested with greater facility than others.

Bone, like other organic matter, is composed mainly of carbon, hydrogen, oxygen, and nitrogen. These constitute its diet, but not its desert. For this it wants salts, and similar materials; and an important, if not the most important one, is the subphosphate of lime. At the risk of disturbing a friend, we will state that this is not the neutral phosphate, but a much more stable salt—one that will endure a white heat, without decomposition. To distinguish it, some of the older chemists have recommended that it, be called simply "bone phosphate." Not only is this ordinarily the most important salt concerned in osseous development, but it is often, if not always, the most difficult to obtain and assimulate. And this statement is all the more confirmed by the fashionable habits of separating the greater portion of the phosphate from the food producing grains before using them. As early as 1854, we called earnest attention to this, recommending that whole flour be substituted for the white family flour of commerce. We had been administering the bone phosphote as a medicine, to aid in bony development, from the time we began practice, in 1844, and we never had cause for discouragement in its use. Good results were as uniformly obtained from its administration as from other medicines. Prof. Taft will remember a case thus treated, in 1849 and 1859, with the most satisfactorily results. At the risk of hearing something told you before, please listen to a report of this case:

Mrs. M., age 25, was the mother of two children. She had suffered much from defective dentition, and needed an upper artificial denture. The two children had scarcely any teeth, and were often crying with toothache. A third conception had taken place. From about the third month of utero-gestation, at our suggestion, she used daily, and usually three times a day, the bone phosphate. From a pale, emaciated women she became full-faced and rosy-cheeked; had an easy, natural labor; the babe weighing over twelve pounds; and this child, in time, had a most excellent set of temporary, followed by an equalled good set of permanent teeth. The phosphate was continued during the period of lactation. The contrast between this child and the other two was too decided to be accidental; and the case is merely a type of others treated in similar way.

In 1855, we mentioned this case to Dr. Elisha Townsend and a few other dentists. One of them reported it to his family physician, and requested that his wife be allowed to follow the same course. The physician feared that it might render the labor more difficult, but the phosphate was administered in rather limited quantities. The result was quite satisfactory, and continued to be so till all but the third molars were developed. We then lost sight of the case. The other children in the family had very defective teeth as compared with the one aided by the bone phosphate.

The phosphate used in these cases was prepared by dissolving bones in hydrochloric acid, precipitating with ammonia, and washing and drying the precipitate. We do not think any *better* form of the medicine has been suggested, but some have been prepared so as to be more pleasant and palatable.

But food is better than medicine. Let foods rich in the phosphate be used. The lean meat of beef, mutton, fowls, etc., answer a good purpose. Cracked wheat, oatmeal grits, if properly prepared, are also valuable. From experiments tried long ago, we were led to believe that veal and pork are not rich in the phosphate as are the meats above mentioned.

Some authors speak of the subphosphate being unreliable, if not inert, as a medicine, on account of its insolubility; but there objection loses force through their accompanying statement that it is *highly soluble* in hydrochloric, acetic, and lactic acids. We may add that it is also highly soluble in solutions of carbonic acid; this being the agent that holds it in solution in normal saliva, which can be well remembered by association with the fact that it is the removal of the free carbonic acid from the saliva, by ammonia, that causes the precipitating of this salt in the form of tartar. As all our of these acids are common in the stomach, there can be but little difficulty in obtaining a solution of the salt in it during the process of digestion.

Others have objected to the use of this salt on the principle that inorganic matter cannot be assimilated by the animal economy. But as this drug is obtained by solution and precipitation from *bones*, the inorganic objection fails.

If readily obtainable, it is well to use some of the more elegant preparations, such as wheaten phosphates, lactro-phosphate syrup, etc.; but sometimes a fatal delay occurs, because these are not at hand. If not already prepared, the preparation of the salt is so simple, and the chemicals needed in the process are so readily obtainable, that there is no excuse for delay or negligence.

In considering this topic, it is to be understood that all the nutritive functions are to be in good working order. Sometimes the digestive apparatus and the assimilating layers are so feeble that they are scarcely able to develop any of the tissues. If possible, these are to be restored to health and strength preparatory to special development; for we can scarcely promote osseous development when the vital powers are so enfeebled. And this state of affairs suggests counsel and co-operation with the family physician, provided he is a gentleman, and not an empiric.

To sum up, let us bear in mind that all tissues are built up from materials taken from the blood; that the nutritive functions create nothing, but only digest, assimilate and appropriate; that, therefore, unless the needed materials are in the blood, in the required quanities, there must be defective tissue building, or no development of tissue at all; that when the needed materials are abundant, there must be, other things equal, a better and fuller development than when they are deficient in quantity.

We have tried, in a hurried way, to discuss the general principle, rather than to give recipes. Such a course is more likely to call out original thought.—*Ohio State Journal of Dental Science.*

ARTICLE IV.

A HISTORY OF DENTISTRY.—THE PROFESSIONAL ADVANCEMENT IN THIS COUNTRY.

BY GEORGE H. PERINE, D. D. S., NEW YORK

The wonderful advancement made in this country in every art and science within that brief space occupying the interval between the opening of the ninteenth century and the present time, has caused the eyes of the old world to turn toward us in astonishment, and the history of this age generations hence will appear to the reader, more like an Arabian Nights' tale than of sober truth. Dentistry has more than kept with the other arts and sciences in their advancement toward perfection. The first step in her upward journey at the opening of this century was, we consider, the publication in Baltimore, in 1801, of a treatise on the teeth, by Dr. R. Renner, a practitioner in that city, which is generally believed to have been the first upon the subject published in this country. Following closely upon Renner's little work, came one from the pen of Dr. B. T. Longbotham, also a Baltimore dentist. The object of this work was to enlighten the public regarding the importance of dental treatment, and in it the writer advanced new theories as to the cause of diseases of the teeth and gums. To the life and labors of the distinguished men of which we will speak, the history of our profession in this country is largely indebted. Bringing to its aid minds of extraordinary culture and capability for skill, their influence was deeply felt and gave importance and respect which was widely extended to our then neglected science.

John Randall was born in Massachusetts in 1773. He graduated from Harvard University and commenced practice in Boston about 1805. He was induced to undertake the study of dental surgery during his college career, through, the ignorance displayed regarding that important branch of medical science by a prominent medical man. When Randall began practicing, dental operations consisted almost entirely in the extraction of teeth and the introduction of artificial dentures, little or no attention being paid to the treatment of diseases of the mouth. The number of practitioners who deemed the preservation of the teeth a subject worthy of their consideration was exceedingly limited. Randall, adopting the theory that there is no disease without a remedy, applied himself to the task of discovering a proper mode of treatment for diseases of the gums and carious teeth. By perseverance and study he became proficient in the dental art, which he practiced in connection with the science of medicine. He was particulaaly successful and his active professional labors covered a period of over forty years. He died in 1843.

To give the reader an idea of the crude state of the pro_ fession, or at least the limited knowledge possessed by some of those who undertook its practice, we may call attention to

Leonard Koecker, a German, who began practice in Baltimore in 1807. With a few instruments and an abundance of assurance he made known his intentions. His first operation was the extraction of a tooth which he performed with closed eyes and palpitating heart, very much after the manner of a boy making his first shot with a gun. It is recorded that the patient survived. Koecker, after something of a struggle, met with success, and gained a high reputation as an able and skillful dentist. From necessity, he made many of his instruments and annealed his own gold foil. Leonard Koecker was born at Bremen. in 1785, and while still young he came to this country. In 1822 he returned to Europe and settled in London. Between 1826 and 1835 he published works on Dental Surgery, Artificial Dentures, &c. His death occured in London, August 8th, 1851.

Benjamin James was in successful practice in Boston about this time. He was a man of somewhat exclusive habits. In 1814 he published "A Treatise on the Management of the Teeth."

It was in the year 1816 that John A. Szymanski came to the United States and located in Philadelphia. He afterwards traveled over the states and practiced in many places with success, and did much to advance the specialty in this country. He was born at Warsaw, Poland, in 1793; graduated in medicine at Dantzic, and in 1814 commenced practice. He went to Sweeden and entered the hospital at Gottenburg, where he remained for a time; thence to England, and devoted his attention exclusively to dentistry. Dr. Szymanski possessed a thorough scientific knowledge of his profession, and was a gentlemen of fine education, courtesy and polished bearing. His death occured in January, 1829.

A. A. Plantan came to this country from France, about 1817, and settled in Philadelphia, where he began practice. He was a man of fine education and brilliant attainments. His interest in the advancement of the specialty was marked, and his improvements many. He was the first to introduce and manufacture porcelain teeth, in this country. He was born in 1774, and died in the sixty-fifth year of his age.

About this period, Levi S. Parmly, the oldest of the five brothers, four of whom became dentists, had gained considerable prominence in Boston as a dental practitioner. He was a student under Dr. Petrie, an English dentist, in 1812, and, being a man of superior talents, gained for himself a high professional reputation. In 1815 he went to Montreal, and thence to Quebec, where he practiced for some time; from Canada he returned to the United States, and tarried for a period in the West and South. Later, he made his way to London, where he practiced for a few years. In 1819 he published a work entitled "A Practical Guide to the Management of the Teeth." In 1821 Dr. Parmly delivered lectures in this country on "The Natural History and Management of the Teeth," the causes of their decay, &c., and was also the preceptor of several who afterwards became quite eminent as practitioners, among whom was a younger brother, Dr. Eleazar Parmly. In 1845 Dr. Parmly presented to the profession a valuable paper on Dental Hygiene, which attracted considerable attention. Dr. Parmly returned to Europe, settled in France, and died in Versailles, July 8th, 1859. His remains were brought to this country, and interred at Perry, Ohio, August 29th of the same year, that being the seventieth anniversary of his birthday.

The effort made by active members of the profession to induce the public to realize the importance of dental treatment began at length to produce, in a measure, the desired effect, and practitioners who had hitherto remained inactive awoke to a sense of duty and soon began to assist in every way in their power toward the advancement of professional interests, and "Observations on the Teeth," a small work, was published in 1820 by Dr. Esseveid, of Charleston, S. C., and a second edition of the same work, somewhat enlargeed, appeared a few years later.

In 1824 Dr. Elazar Gedney, who had acquired a high reputation for skillful practice, both in this country and in England, published in Utica, N. Y., where he was then located, a small book bearing the title "The Human Teeth." Gedney's successor in Utica was Dr. A. Blakesley, a skillful dentist, who for years retained the confidence of the community in which he resided.

About this time the number of dental practitioners in the United States did not exceed one hundred, and this number included Dr. John Trenor, of New York, (who, in 1823, contributed to professional literature a paper on the "Teething of Infants," and in 1828 presented his "Physiological Inquiry into the Structure, Organization and Nourishment of the Human Teeth," and a year later his "Observations on Neuralgia" appeared, also "Remarks on Dental Education"); and Dr. Samuel S. Fitch, of New York, (author of "A System of Dental Surgery," a valuable work of reference, published in New York, 1829, the second edition of which was published in Philadelphia, in 1835, whither the writer had removed.)

With each succeeding year the number of the specialty rapidly increased, and with this augmentation naturally came increased knowledge and enlightenment, and a desire on the part of the people for proper dental care so greatly increased the demand for the services of skillful practitioners that many were accustomed to migrate into the rural districts, or make periodical visits to neighboring and in some instances distant cities.

Among these itinerants of worthy professional reputation were Drs. Brewster, Cleveland and Ambler, of South Carolina, Hayden and Harris, of Maryland, Brown and Hale, of Missouri, McReynolds, of Georgia, Badger, of Tennessee, Hullihen, of Virginia, Flagg and Townsend, of Pennsylvania, Keep and Miles, of Massachusetts, Taylor, of Kentucky, Baker and Parmly and Solyman Brown, of New York. The latter, who contributed somewhat liberally to dental literature, will doubtless be remembered by many of the old residents of Long Island, from the fact of his traveling from place to place in considerable state with his chariot and pair, and there is no reason to doubt that a few traces of his skill still remain, reminders of the days when dentistry was little thought of in the rural districts until its missionaries, so to speak, brought it to the very doors of the people, and thus gave them an insight into the benefits it was destined to bestow upon mankind. Not all, however, of those who made professional pastoral pilgrimages left behind them enduring traces of their skill; but often, quite to the contrary, fractured jaws and partly-extracted teeth impressed upon the mind of the unfortunate patient a recollection which years could not remove, and ever after caused the sight of a dentist's *modest sign, in the shape of a somewhat exaggerated gilded tooth*, to produce convulsions of an alarming character. Perhaps the following anecdote, which may be somewhat embellished, but which will give the reader a fair idea of the character and skill of some of the itinerant so-called dentists of the early days of the profession, may prove interesting:

To a certain small hamlet, in the days before railway tracks intersected each other in all parts of the country, like the network of telegraph wires hung in the air like spiders' webs, on a summer morning, there came, with staff in hand and kit on back, a youth who, through the medium of a circular couched in questionable English, announced his willingness to perform for a moderate fee all manner of dental operations, from the extraction of a deciduous incisor to the insertion of artificial dentures likely to cause Dame Nature to blush at her inefficiency in her dental efforts. Several simple operations performed with comparative success were instrumented in procurring for our disciple of Wooffendale a desirable patient in the form of a well-to-do but rather intemperate farmer, whose upper teeth were entirely gone, and who gave our knight of the forceps an order to supply their place with an artificial set, which were accordingly constructed and inserted, and the practitioner, having received his fee, buckled on his kit and set out for the next town. The distance being something like thirty miles, he was obliged to pass a night at a wayside tavern where, the next morning, he was at an early hour called upon by his late patron. "Look a-here," shouted the irate tiller of the soil, confronting the astonished tooth manipulator, "what do yer take me fer, anyhow—a huskin' machine? Look at this 'ere corn-cob what you put inter my mouth yesterday; there ain't a kernel left on the infernel thing," and the indignant rustic produced the bone base from which every tooth had disappeared. "Good heavens!" exclaimed the professional gentlemen in apparent astonishment, and then, as if seized with a sudden thought, he inquired, "What did you eat after those teeth were put into your mouth?"

"Mush and milk," replied the farmer.

"And what did you drink?"

"Apple brandy," was the reply.

"That accounts for it," exclaimed the practitioner, impressively. "You see, sir, the teeth I made you were attached to a base composed of hippopotamus ivory. Now, sir, you must understand that the hippopotamus is an animal which lives a greater part of the time in water. In the temperance sense it is totally an abstemious animal, and when the fiery beverage you are accustomed to came in contact with the fragment of the animal's anatomy to which your artificial teeth were attached, the shock was great, and actually produced so decided a shock among the nerves contained in the bone that the teeth dislodged from their setting."

If not satisfied with our friend's explanation, it is safe to conjecture that the farmer withdrew from the presence of his dentist somewhat mystified.—*New England Journal of Dentistry.*

ARTICLE V.

ANTISEPTICS AND DISINFECTANTS.

BY E. J. LILLY, M. D., CIRCLEVILLE, O.

[Written for the Mad River Valley Dental Society.]

So much has been said of late about antiseptics and disinfectants that seemingly nothing more remains to be disclosed. But in looking up the literature of the subject we find so many contradictory statements that it would almost be an impossibility, without direct experiment in each case, to tell what is true and what is not true. To carry out such a series of experiments, however, would require no little time and labor; for to gain any reliable results the conditions should be as diverse and varied as possible, the agents used in all degrees of strength, and the results, in every case, noted to the minutest particular. We haven't much that is new to offer in this regard, but will attempt a short sketch of what has been accomplished and is best known relative to the subject.

By an antiseptic we understand a substance which has the power of preventing decomposition in dead animal or vegetable matter. A certain degree of warmth, together with moisture and access of air, are necessary to the occurrence of putrefactive changes, which consist essentially in the breaking up of the complex organic compounds, and the formation of new and simpler combinations. During the process various gases are envolved, and lower forms of animal and vegetable life are observed to grow and multiply in the decomposing mass. Putrefaction may be prevented by removing one or more of the conditions under which it takes place. If, after subjecting the substance to a certain degree of heat, air (and of course the organisms suspended therein) be excluded, and dead matter can be preserved for an indefinite length of time. Extreme cold will accomplish the same result, though in a different way. Numerous chemical substances have the power of preventing decomposition, while others have a deodorizing property, acting by oxidizing, deoxidizing, or otherwise changing the chemical constitution of the substances, and are, in virtue of these properties, effective disinfectants to that degree.

A disinfectant proper is understood to be a substance, or preparation, that will not only arrest putrefaction by destroying the cause, but will, at the same time, render the products thereof harmless. There is no connection between the power which prevents decay from setting in and that which checks or stops it when once begun, for antiseptics in general have but a slight effect upon bacteria. Exceptions are found, of course, in those substances, like corrosive sublimate, which are violent poisons, and which are both antiseptic and disinfectant.

The increased attention bestowed, of late years, upon sanitary matters has led to the manufacture of numerous materials claiming to be valuable as antiseptics and disinfectants. But so many of them having been tried and found wanting, the tendency now is to undervalue and decry the use of nearly all. The failure to obtain satisfactory results is, in many instances, probably due to confounding antiseptics, with disinfectants and deodorizers, trying to make one agent do the work of another, and from ignorance, perfectly justifiable in many cases, of how, when, and where to apply them. For instance, if we wish to purify some water, in which is suspended decaying vegetable matter. What agent will best serve the purpose? Shall we use carbolic acid? or corrosive sublimate? The odor of the first would simply mask the other smell by its own, while the second would not even do that. Of course the mercuric chloride would be death to the animalcules in the water, but citric acid will detroy all of them, except cyclops and those with thick epidermis, in two minutes, and still leave the water fit for use. Evidently some oxidizing agent, like potassium permanganate, or, better still, hydrogen peroxide, is indicated. Again, we wish to be relieved of some obnoxious odors, of which hydrogen sulphide is the most prominent and disagreeable, and the question is, what agent to use in this case. Would creosote, salicylic acid, sodium chloride, or potassic permanganate answer? Neither of them would be of much value, but plumbic acetate, or some other metallic salt that would decompose and unite with the sulphide, would be the correct remedy. Or, take some putrefying animal matter. Plumbic acetate, to combine with the sulphur compounds, is indicated for one thing. But since, for the purpose of disinfection, it is not only necessary to destroy odors and retard the development of spores, but it is also needful to kill the micro-organisms, and that, too, in the shortest possible period. Therefore only such agents as are bacteriacides, like mercuric chloride, bromine, etc., can be effectively used in such a case, and are the agents to select.

The study and correct application of true antiseptics and disinfectants may be regarded as a very important practical question; for the sanitary weal of the individual, of cities, and even of countries, sometimes depends upon rational disinfection. But with even our most powerful agents, it is almost impossible, at times, to render innocuous the gases of decomposition and decay, or to accomplish the destruction of those living organisms of simple structure, whose importance relative to the propagation of disease we have so much reason for believing to exist, so tenacious, of life, so minute and unfindable are they. If we knew always just where to look for them, and, after having found them, what agent to apply to each species, what sized dose it was necessary to administer, etc., we could most assuredly contend against them successfully. As it is we are in the predicament the Irishman was with his flea remedy He had his brick all ready, but the flea had first to be caught before he could mash him with it.

Fortunately many of these noxious substances give us warning of their presence though the medium of the olfactory organs. It will be remembered that the sense of smell is excited by gases only, including of course under this term the vapor of liquids and solids which have low vapor-tension, and which, in consequence, give off vapors at the ordinary temperature. The difference in smells or odors is caused by the difference in the nature of the vibrations of the gaseous particles, just as the difference in the tone of musical sounds depends on the rate and on the nature of the vibrations which strike the tympanum. So we cannot properly say we smell a decomposing mass, but only the gases envolved during the process; and we are too apt to think that the only deleterious products of decomposition are those that offend the nostrils, being satisfied when the odor has been destroyed. This is a mistake. Among the products of putrefaction are some gases, mostly sulphur compounds, of very repulsive odor. This is a most fortunate circumstances in one respect, as the odor not only serves to make its presence known, but prompts, the individual either to flee from it, or employ ventilation for comfort's sake. But it is not only foul-smelling substances that are harmful, for they may be deodorized yet retain their poisonous properties long after the odor is gone. For example, carbon disulphide, a very poisonous liquid, the vapors of which produce intense headache and vertigo, has, usually, a repulsive odor; but it is not difficult to deodorize it without affecting its other properties. Deodorized alcohol is no less a poison than it was before. Then again there are substances, like carbon monoxide. marsh gas, etc., which possess no odor, and their presence is made manifest only by the effect produced in inhaling them. Against such substances we have no protection except nature's disinfectant, the atmosphere. Yet there are numbers of agents which, used intelligently, will bring about excellent results, and it will be found that each possesses a definite scope of action. Thus carbolic acid is, in general, the antiseptic for crude masses of matter, salicylic acid for the laboratory, while thymol, hydrogen peroxide, glycero-borates of sodium and potassium, listerine, etc., are to be used in the office.

There are so many materials claiming recognition as good antiseptics or disinfectants that to give a list of them would consume too much time; but they all produce their effect by acting as poisons to the infusorial organisms which are held to be essential to the occurrence of putrefaction. A solution of quinine will prevent decomposition in an organic broth, as will also carbolic acid, salicylic acid, borax, alum, iron salts, etc., but they cannot properly be called disinfectants, although they are frequently used for the latter purpose. But carbolic acid, the essential oils, burnt coffee, scorched rags, and the like, all have an odor of their own that only masks the other smell without destroying it.

A very good disinfectant, and one that has become quite prominent of late, is listerine. Of course great things are claimed for, but only time and use can determine its true value. Peroxide of hydrogen is another agent that is extensively used for both its antiseptics and disinfectant properties. It is said to instantly arrest fermentations due to the development of living organisms, and the putrefaction of all materials which do not decomposed it. But, as it is rapidly destroyed by so many substances, its application would seem to be limited. When diluted with water and used in connection with prepared chalk, it is excellent as a dentifrice. A good preparation, combining antiseptic properties with a perfume, to drop into our cuspadors after cleansing, is the following:

R

Eu de cologn	8 fl. oz.
Peroxide of hydrogen	2 drachm.
Chloral hydrate	2 "
Quinine (alkaloid)	10 grains.
Carbolic acid (pure)	30 "
Oil of lavender	10 drops,

—MIX.

Generally, antiseptics can be used with good effect in many cases; but the disinfectants—those that can be used with safety—mostly fail to disinfect, so too much reliance should not be placed upon them. Suitable precautions should be taken to render their use unnecessarily; impure air should never be breathed, nor should preventable causes be allowed to pollute the air. Decay and decomposition can usually be prevented by antiseptics, if in no other way for it is much easier to prevent putrefaction from setting in than to check its progress after it has once begun.—*Ohio State Journal.*

ARTICLE VI.

DENTAL DIAGNOSIS.

BY A. T. BIGELOW, D. D. S., BISMARK, DAKOTA.

To every one who considers the matter, it must be evident that this is an important branch of dental pathology.

The scope of this paper will be limited to the consideration of a few points, deemed essential, mostly the deductions of actual observation and experience.

Ætiology will not be touched on, but rather the ascertainment of actual conditions on inspection, as a basis for intelligent professional service.

The face of every tooth should be presented, directly o by reflected image, to the eye, especially the approxima surfaces whenever there is reason, from general indication, to suspect decay.

Stress is laid on this, on account of the approximal surfaces being less accessible, and as being the part most commonly neglected.

Direct separations by wedging, if the teeth are not firm in sockets, will afford requisite space, or a section of French tubing number ten, employed where the first method is not practicable.

Given an educated eye, a good plain five eights inch mirror, slightly heated, several delicate exploring instruments of suitable construction, and "ocular proof" may be had of the encroachment of the greatest enemy, caries. On a suitable diagram should be noted the defects revealed, beginning with the right dens sapientiæ as number one, and ending with its antagonist as number thirty-two.

This will afford a comprehensive idea of the general condition of the organs and their needs.

If a complete examination is not desired, but only attention to immediately necessitous cases, these may be easily detected on mesial and distal surfaces of bicuspids and molars by drying with a hot air syringe, and observing the discoloration, or opaqueness, ranging from pale yellow to blueish black.

In all cases where decay has progressed extensively and the patient has felt marked discomfort, or pain, very nice discrimination will need to be exercised to effect a sound diagnosis. Would first ascertain for how long time and to what extent disagreeable sensations have been experienced. If of recent origin and no more than an occasional "twinge," capping at once would be indicated.

If the trouble has existed for some weeks the pain at times lancinating, with intervals of quiet, there is considerable inflammation, and soothing applications should be made and the air excluded for a time, before permanent stopping is effected. In more serious cases, where the sharp and intermittent have merged into constant grinding pains, there is much inflammation with congestion, probably involving the whole of the ganglion and possible extending into one or more of the canals. Very likely on removal of the detritus there will appear a protrusion of the pulp into the cavity of decay. If without suppuration would resort to a little blood-letting by acupuncture to relieve distended vessels, applying topical dressing. Should the case yield kindly and the inflammation subside without suppuration, the operation of capping and filling may eventually be performed with a good prospect of success. Have never tried Dr. Allport's method of incising the protuberant pulp to accomplish the same object, the needle lance operation being less heroic but equally effectual in results, the enlargement usually contracting to normal size on depletion of blood vessels, in a few days.

If the more advanced stage has been reached, and partial sepsis occurred, would deem capping contra-indicated. I have dwelt at some length on the indications favorably and otherwise for saving the life of the tooth, having been frequently called upon by patients in transit to relieve them from severe suffering. On minute examination have found too often, for the honor of the profession, fillings inserted on devitalized pulps, or that the operation of capping had been so inconsiderately, or unskillfully performed that the death of the pulp ensued.

Recently service was rendered a patient who said her teeth were pronounced in good condition by her family dentist only a short time before she left for the West. The name given is not unknown to the profession, and the gold work exhibited was exceptionally fine. Only a glance was needed to disclose the tell tale opaqueness on mesial surface of first superior molar, and excavation developed a large cavity that must have had its inception more than a twelve month previously. Was it culpable negligence or want of apprehension of pathological indications? This is cited as a typical case to show the necessity of systematic practice that our clientage may not suffer, from the defective faculty being faulty, where the manipulative ability is excellent. There are other and less common dental affections that require much skill and experience in determing their nature, in some instances baffling all known means of ascertainment. Will offer a few selected from my case book, in illustration. Patient complained of a slight unpleasantness in one of the superior incisors. No external defect appeared. The color of left central was a shade darker than that of the adjoining teeth, but with no more variation than is often seen between incisors and cuspidati. No marked sensation produced on tapping with an instrument. In such a case the phonetic or percussive method may be adopted in detect a necrosed tooth, similar to that employed in diagnosing diseases of the thorax or abdomen.

The most available agent to employ is the ivory handle of a mouth mirror. It should be held between the thumb and second finger of right hand and gently tapped with index finger, applying the blow to the labial surface. The sound elicited from a normal tooth will be found clear and resonant, while the necrosed organ yields a sound perceptibly lower in pitch and more muffled or obscure. These distinctions have proved constant so far as I have yet experimented and may be relied upon in determining those infrequent cases where from a blow or some unknown cause, the pulp has lost its vitality. The proper employment of this mode necessitates some degree of skill in application, and the possession of a musical ear, capable of detecting minute variations in quality of sound.

A young married lady consulted me on account of severe pain located in first left superior molar, for which, after the most careful scrutiny, I was unable to assign any adequate cause. There was a small gold filling on grinding, and a somewhat larger one on anterior approximal surface, but not suspect that the latter encroached upon the pulp. There seemed to be no symptoms of exostosis and the general health of patient precluded any probability of the cause being reflex or sympathetic. In my perplexity I had recourse to the Micawber plan, hoping something might "turn up" to help me out of the dilemma. The only clew afforded was that in treating the corresponding molar, about six months previously, a small calcification had been discovered in the pulp after its removal, and this seemed a good opportunity to test the bilateral theory. Not wishing, however, to make a serious error in treatment, I removed the larger filling, applied a pellet of cotton saturated with pure wood creasote, painted the gums with aconite and iodine, and requested the patient to call next day. She reported early in the morning, having suffered considerably during the night, and desired the tooth extracted. This I declined to do, but made the usual application to destroy pulp, and on the second day thereafter had the satisfaction of finding in distal portion of ganglionic cavity a large calcification, having somewhat the form of an eclipse, measuring in length twelve one hundredths, and in the short diameter, six and one half one hundredths of an inch. Viewed superficially with a low power microscope, it presents more the appearance of cementum than of enamel or dentine. It is presumably of the same constitution as the so called secondary dentine.

I will now give the history of a unique case. A healthy looking young lady, about twenty years of age, visited my office on account of severe pain, located in first and second right superior molars. Careful examination showed no cause, in fact her dentine was exceptionally perfect in form and structure, no caries being present. I had much difficulty in persuading her to delay the extraction for a day or two ; meantime topical application was made, more to gain time than with any expectation of amelioration. On the second day there was observed, over the seat of pain, a slight swelling, accompanied by redness and inflammation. Being satisfied it was a disease, not having a strictly dental origin, the patient was recommended to consult a physician. The doctor advised with, pronounced it erysipelas. The case was successfully treated and she had no further trouble with her teeth.

[TO BE CONTINUED.]

AMERICAN ACADEMY OF DENTAL SCIENCE.

The 17th Annual Meeting of the American Academy of Dental Science will be held in Boston on Wednesday, November 5th, at 3 o'clock P. M.

The Annual address will be delivered by E. M. Harris. D. D. S., of Boston.

E. E. HOPKINS,
Recording Secretary.

85 NEWBURY ST., BOSTON.

MARYLAND STATE DENTAL ASSOCIATION.

The Second Annual Meeting of the Maryland State Dental Association, will be held in Chemical Hall, University of Maryland, November 13th, 1884, 8 o'clock P. M.

WM. A. MILLS, *Recording Secretary.*

49 S. BROADWAY, CITY.

MONTHLY SUMMARY.

MICRO ORGANISMS.—From advance sheets of the Introductory Lecture at the opening of the fall course of the Medico-Chirurgical College, of Philadelphia, by Prof. Hugh Engel, we glean the following interesting points about micro-organisms. The address, in full, will be published in our columns. For a long time investigators were undecided whether micro-organisms, as they are comprehensively termed, belonged to the animal or the vegetable kingdon. It has now been decided that they belong to the latter. The terms *micro-organisms*, *microbes*, and *microzymes*, all mean the same thing. Micro-organisms are divided into two primary divisions: 1, HYPHOMYCETI, and 2, SCHIZOMYCETI. The first class are the pathogenic factors of external diseases, as favus, aphthæ and thrush; while the second clause the internal diseases. The schizomyceti are subdivided into the following classes:

1. COCCI or MICROCCOCCI, which are small round bodies, and embrace the cocci of phenomena, pigment cocci, and some ferment cocci.

2. BACILLI, which have a rod-like shape, whether long or short, such as the bacilli of typhoid fever and tuberculosis.

3. BACTERIA *proper* (the whole class are often called bacteria,) such as bacterium termo, the common grade ferment.

2. VIBRIONES or VIBRIOS, those which have a wavy form, as *probably* the comma bacillus of cholera.

5. SPIRILLI, in the form of stiff screws, such as many of the micro-organisms causing decomposition.

5. SPIROCHÆ, in the shape of flexible screws and other fantastic forms, such as the micro organism of relapsing fever.

It has been calculated by Ferdinand Cohn, that if the bacterium termo were unimpeded in its propagation, and if one were to multiply into two in the first hour and these into four in the second hour, and these into eight in the third hour, and so on, the result would be 16,000,500 in the first day, and 281,000,000,000 on the second day, and that in five days' time the progeny of this little microscopical body would fill the oceans of the world, so wonderfully numerous and fertile are they. One microccoccus, one fivehundredth of a millimetre long and one one-thousandth of a millimetre thick, and of which 1,600,000,000 are required to weigh one grain, would in three days produce 50,000,000, pounds of offspring.

Teberine is a disease of the silk-worm that threatened to destroy the silk industry of France. Pasteuer found a bacterium in ova that were apparently healthy; all such avo were destroyed, and the threatened danger was averted.

Dr. Koch, of Berlin, furnishes some strong reasons for believing that the comma bacillus is the cause of cholera. When in Toulon, Dr. Koch made it a practice to carefully examine the discharges from, and the dead bodies of, all patients with typhoid fever, dysentery, and the like. In not one single case did he find the comma bacillus. A French sailor was in the hospital, convelescing from typhoid fever; there were no evidences of the disease remaining, he was only weak. At nine o'clock one morning he received word that he would be discharged at noon. At ten o'clock he was taken sick with cholera, and died before eleven. Within six minutes after death an autopsy was made in the presence of Koch. No morbid lesions were found, but the rice-water contents of the intestines contained innumerable commo-bacilli.

In a village in Egypt, thirty persons were taken sick in rapid succession with cholera; they were the first case in the village. It was discovered that all of these persons had been engaged the day before in washing the clothing of cholera patients. Koch found that wherever portions of clothing soiled by cholera dejections were moist, the commo-bacillus existed in abundance; but it cannot survive more than twenty-four hours without moisture.

In a village near Calcutta, several hundred persons died from cholera in the space of thirty hours, while in villages still nearer to Calcutta (where the disease was raging) no cases had occurred. It was proven that all the persons who were attacked had used water from the same tank, and it was discovered that the day before the outbreak women had been washing clothing from cholera patients in Calcutta in this tank. And, furthermore, it was discovered that wherever, in the tank, there were accumulations of decomposing wood or organic debris, there also would be found innumerable comma-baccilli. It is said that it was the recital of this remarkable experience that caused the distinguished Professor Vichow to give his sanction to the pathogenic nature of the comma-bacillus.

Dr. Koch has also discovered that the bacteria of putrefacsion are inimical to and capable of destroying the comma-bacillus, and in this connection it was noted that whenever the sewers in Toulon were cleansed or disinfected, the cholera became worse, which fact would tend to explain the reported immuity from the disease among the scavengers of Toulon and Naples.

Acids destroy the vitality of the comma-bacillus; hence we have an explanation of the fact observed during the last cholera epidemic in London, and of the recommendation made some years since by Professor Da Costa, that when the prodromic diarrhœa is treaten with sulphuric acid cholera does not develop.

It has been also observed that this bacillus cannot pass through a healthy stomach; its vitality is destroyed. It was universally noted in Egypt, Calcutta, and Toulon, that not one single case of cholera occured in an individual whose stomach had been previously healthy. In every case there had been some slight or severe derangement of the alimentary canal. In this connection, attention is called to the fact that in Europe overloading of the stomach is most common on Sundays, and the largest majority of the fresh cases of cholera would develop on Mondays.—*Med. and Sur. Reporter.*

TREATMENT OF SICK HEADACHE.—Dr. Richard G. Jack reports this instructive case in the *Lancet*, August 23, 1884:

Mrs. N., aged 26, married, two children, had all her adult life suffered to some extent at the periods, and also was troubled with what is commonly called "sick-headache." She was treated by various doctors in the Western States of America, and at length she sought the advise of Dr. Thomas, of New York. He came to the conclusion that the only possible relief was to be obtained by removal of the ovaries; that she was then much to broken down for the operation; but after a trip to Europe had set up her health, he would, on her return, operate. I first saw the patient in June, 1883. She was then in the second day of the period, and under one of her headaches. These begin in one side of the head, and the pain gradually increased until the patient loses consciousness, the limbs become rigid, the hands clenched, the eyes half open and turned up, and shivering fits come on every few minutes. At other times the attack takes the form of spasm of the glottis. Seeing her first in one of her severe attacks, I introduced my hypodermic needle, and injected one-sixth of a grain of morphine. I left the needle in, and in seven seconds relief was obtained; but as it was not complete, at the end of five minutes I gave the same quantity, and withdrew the needle The pain subsided, and did not return during that period, but the patient suffered from severe sickness, which lastly thirty hours. In a few days I ordered iron and quinine, with shower-baths, good food, and early hours. When the next period was expected, I gave belladonna and bromide of potassium. As soon as the period came on, I kept the patient in bed, applied a blister of the size of half-a-crown over each ovary, and ordered a morphia pessary at night. The period passed over without a sign of pain or trouble. The tonic treatment was resumed, and the patient's health was steadily improved. The next period was anticipated a day or two with the belladonna and bromide, and when the flow began she was kept in bed the first day with half a mustard leaf over each ovary. No pain; period normal. On the next occasion, feeling the restraint irksome, and forgetting the date, the patient went to a theartre on the very night of the return of the period, and at 1 A. M. I was sent for. I injected one-third of a grain of morphia; the relief was instantaneous, and by increasing the dose to half a grain the sickness dimished. I tried the addition of atropine, but without effect. By persistence in the treatment, essentially the hypodermic, the patient is freed from headache, and no longer looks sick in mind and sick in body, having regained color in her cheeks. I have repeatedly seen the same good effect in ordinary sick-headache, either from hypodermic injection of morphia or from a dose of chlorodyne.—*Med. and Sur. Reporter.*

PREVENTION OF IRREGULARITY.—Mr. J. R. Brownlie, L. D. S., Glas., read a paper also on the subject of "Prevention of Irregularity." He said that while a regular arrangement of the teeth as a result of nature's handiwork was common enought, Dentists were frequently called on to see the results brought about by certain other forces acting at variance with those named, giving to the teeth a crowded arrangement which was a blemish in the mouth of beauty, and which was an important factor in the production of dental caries The age at which prevention could be carried out was a very early one, a much earlier age than Dentists usually had the opportunity of applying their knowledge. One of the earliest habits a child acquired giving rise to deformity was that of sucking the thumb. Next there was the possibility of the teeth of the first set becoming a cause of irregularity to those of the second. He also took occasion to refer to the practice of people setting no money value upon the services rendered and time occupied in consultations. An operation, he said in itself so simple that the very veriest clown could hardly blunder, was credited with a money value, and the fee readily paid, while the special knowledge which had to be acquired by years of study, and which alone enabled one to deal intelligently with the conditions of the mouth, was set at naugh too frequently as a thing not worthy of any recognition. Indefensible thoughout, the practice was one which was essentially objectionably in regard to the case of children's mouths. If a dentist knew beforehand that on his decision would rest the question of fee or no fee, it was too much to expect from human nature that his decision would be free from bias, and founded purely on the merits of the case. The temptation was too great. If it were a question of the extraction of a temporary tooth, the operator should more than likely do what was wanted done by the parent, who was quite incapable of forming any adequate opinion of its ultimate effect upon the mouth. Was it possible that under such conditions the opinion could be founded purely on the merits of the case? The position could not be defended, and there were but few of those parents or friends who interested themselves in the subject who were not capable of recognizing the risk to which the best interests of the child were exposed, and with whom a word or two of explanation was all that was needed to secure to the operator unreservedly an opportunity to act or abstain from action *secundum artem.*

A NEW METHOD OF REMOVING NASAL POLYPI.—Dr. William Ralph Bell says: "I take the liberty of bringing the mode of treatment before the notice of your readers which I have practiced with the very best results in several cases. It obviates any trouble from hemorrhage, which is frequently the case when the forceps or hooks is used; it is plainless and very simple. I get my patient to blow strongly through the affected nostril, closing the other with his finger. The polypos will be brought down so that it can be easily seen through the external nares; then with my hypodermic syringe charged with a solution of tannic acid in water (of the strength of twenty grains to the fluid drachm,) I pierce the polypus with the needle, and inject ten, fifteen, or twenty minums of solution, according to size of tumor. In a few days the polypus shrivels and dries up (tanned;) it comes away without any trouble or pain, and looks like a clot of dry blood, my patients usually removing it by blowing the nose or by their fingers. In only one case, that of an old lady, had I occasion to remove it myself, and in her case I think she was afraid to do so, for when I seized it with dressing forceps, I required to make no traction to bring it away.'—*Canada Med. Record.*

AN OVERDOSE OF CLORAL DURING PARTURITION.—To a young and healthy patient, in her third labor, one hundred grains of chloral hydrate were given, in divided doses, in the course of forty-five minutes, in mistake for three doses of fifteen grains each. The patient became heavy and drowsy, but could be temporarily roused. The pulse was between sixty and seventy per minute. The pains became slow and ineffective. Fifteen minutes after the administration of the last dose of chloral, the membranes were ruptured, and twenty-five minutes later the child was feebly expelled by natural efforts. It was excessively pale, but began to breathe and cry after moderate efforts on the part of the accoucheur; but the skin did not exhibit its natural color for several hours. The placenta soon followed the child. Two drachms of fluid extract of ergot were given, and half an ounce of brandy. An hour after the birth, the mother was in fairly good condition, and both she and the child made a good recovery.—*Boston Med. and Sur. Journal.*

PREVENTION OF CARIES AND IRREGULARITY.—Mr Henry Sewill, M. R. C. S., L. D. S., Eng., read a paper at a meeting of the British Dental Association on "The Prevention of Caries." He said that caries was impossible without acid, and without vitiation of the secretions of the mouth. Without due exercise in mastication teeth could not easily be kept clean, and where the function was impeded by the presence of tender teeth, these should be brought into a healthy state or extracted. Crowding of the teeth greatly prevented the constant beneficial rubbing and polishing of them, prevented the ready access of the alkaline saliva to those surfaces where acid-forming substances find their location. He was afraid they could not hope that for the sake of the teeth of posterity men would be advised to pick out big-jawed wives but they could at least seriously impress hygienists with the fact that the human jaw needed adequate use for its due development, and that no dietary could be perfect which was composed of uniformly bland and soft substances, calling for little or no mastication.

MIRYACHIT—INCONVENIENCE OF A DISEASE OF IMITATION.—A contemporary has the following, which might have been foreseen. The complaint is obviously a dangerous one:

"There is a new disease, called in Russia 'Miryachit,' and in Java 'Lata.' The person affected by this disease is compelled to imitate anything he sees or hears. A doctor, dining with a riend, had just explained to him the nature of the disease, when the host, pushing forward a bottle of the best 'Encore,' said: 'Try that, doctor, it's ten years old.' The doctor mixed a stiff glass, and, about half emptying it, smacked his lips, remarking, 'Tip-top, sir.' 'Suddenly Barney, an Irish butler, who had been present during the doctor's explanation, seized the bottle, and, filling a tumbler, emptied it at a gulp, and smacking his lips, shouted, 'Tip-top, sir.' 'What the deuce do you mean by that?' shouted the infuriated host. 'Begorra, sir,' replied Barney, humbly, 'Shure, I'm afeard I'm efflicted wud the latha.'"—*British Medical Journal.*

A DANGEROUS ADULTERATION OF IODOFORM.—Dr. Biel, of St. Petersburg, called attention to a commercial adulteration of iodoform with picric acid, which cannot be detected by the test of Pharmacopœia. This mixture is not only poisonous, but is explosive when rubbed in a mortar. It can be detected by the citron-yellow color it yields to a watery fiftrate. If a solution of cyanide of potassium be added to the filtrate, no reaction will follow if iodoform be pure; but if there be a trace of picric acid present, the solution will, in the course of ten minutes, become brownish red (isopurpuric acid,) and in a short time deposits an insoluble precipitate of isopurpurate of potassium.—*Deutsch Amerikan. Apotheker Zeitung.*

WHY NEGROES ARE BLACK.—Surgeon-Major N. Alcock has contributed to *Nature* an interesting communication as to why tropical man is black, in which he suggests that as in the lowest animals pigment-cells placed behind a transparent nerve termination exalt its vibration to the highest pitch, the reverse takes place when, as in the negro, the pigment-cells are placed in front of the nerve terminations, and that the black pigment in the skin serves to lessen the intensity of the nerve vibrations that would be caused in a naked human body by exposure to a tropical sun; that in fact, the pigment plays the same part as a piece of smoked glass held between the sun and the eye.—*Med. and Sur. Seporter.*

HOW MUCH MILK DOES AN INFANT AT THE BREAST TAKE DAILY.—Dr. J. Lewis Smith says (ARCHIVES OF PEDAITRICS, July 15) that he and Dr. Chadbourne determined the amount of milk taken by several infants, by actual weight. Taking 451.9 grains as the weight of an ounce of milk of s. g. 1.031. He concludes that a baby the first five weeks who takes the breast every two hours receives only a little more than a fluid ounce at each nursing. Of fifteen nurslings between six and ten months, the average received by each twenty-four and six-tenth fluid ounces. Hence, if the nurslings were eight in twenty-fours, three ounces were taken at each nursing; if the nursings were twelve. the quantity each time was two ounces. Under two months of age the stomach cannot receive much more than one and a half fluid ounces. At six months the infant can probably take and digest three ounces, and in the last half of the first year four ounces.

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ARTICLE I.

BRITISH DENTAL ASSOCIATION.

WESTERN BRANCH.

The Annual Meeting of this Branch was held at Torquay, on August 2nd Owing to the absence of the retiring President (Mr. Charles Gaine), the President-elect (Mr. W. A. Hunt) occupied the chair.

It was decided to hold the next Annual Meeting in Hereford, and that Mr. McAdam be President-elect.

A question arose as to the eligibility of Mr. Washbourne to a place on the Council of the branch, on account of his publishing the following advertisement:—

> **Mr. Norman Washbourne, Bridge House, Taunton, visits Minehead on the third Monday in each month, at Mr. Floyd's 2, Wellington Square. The next visit will be on August 18th. He also visits Williton on the second Monday in each month, at the Post Office, Mr. Hales' his first visit being on September 8th. Hours 10 to 4. Appointments can be made by writing previously to Bridge House, Taunton."**

Mr. Browne-Mason said this was not an advertisement that could be objectionable, from the simple fact that the gentleman did not even mention his profession. It seemed to him an announcement that was justifiable; but seeing Mr. Smith-Turner present, he should like to hear what he had to say on the subject, as his was an opinion that would have much weight.

Mr. Smith-Turner said the answer to this question was not to be given in a few words. They knew that the object of this Association was to raise not only the social status, but the moral tone of their profession, and one of their great purposes was to discourage a certain mode of advertising which was quite unprofessional. Any body of men claiming to be professional men must be prepared to give up what might be regarded as a lucrative practice, if it was necessary that they should do so, to secure a higher social status. The system of advertising generally pursued was of a very objectionable character, but it seemed to him that an announcement of the kind just read could not be prohibited by any Association without seriously interfering with what might be termed the liberty of the subject. This gentleman did not say what was his profession, or what was the object of his visit, but simply stated that he would visit a certain place at a certain time. It was simply a personal announcement by the gentleman for the convenience of his patients and the public generally. He could not see that it affected his professional position in any way, or his right to be appointed to the Council, or the wisdom of the Council in nominating him. If there were no advertisements of any other kind than these to trouble them their position would be a very happy one indeed. He did not look upon this advertisement as having any objectionable feature, and did not think the Odontological Society would interfere with it.

The President said he was very glad indeed to find that his own opinion coincided with that of Mr. Smith-Turner. He had been asked his opinion on the matter, and had given it in very similar terms. Now, although the gentleman in question might be perfectly justified in publishing this announcement, yet he thought that it was a course the members at large would rather not see adopted. He was glad to say that he believed that if a little influence were used these announcements would not be seen in the future.

Mr. Smith-Turner thought it said a great deal for the Association that it had been able in so short a time to infuse so wholesome a spirit in the profession. They must not forget what they had been in their efforts to strive to make themselves something different.

The President (Mr. Hunt), in his inaugural address, considered the dental profession a scientific profession, undergoing healthy consolidation from day to day.

Dental surgery has with us, until very lately, been passing through its embryonic condition, and yet it needs much careful attention; but in spite of advertisements steeped in falsehood, the genuine services of the educated and competent dental surgeon are more than ever in request, and will continue to be so as civilization advances, and as the true and close relationship of sound teeth to health and enjoyment is better understood. Many of the false lights of quackery will go smokily out; and the true light will be more clearly recognized, and more unhesitatingly followed.

So, then there is every reason why we should march forward hand in hand with the spirit of progress and the true science.

But it has been the nature of scientific truth in the past to unfold herself slowly, rather than by leaps and bounds. She needed diligent inquiry before she yielded herself up. Indeed, as a rule, the beginnings of science are not sudden and palpable, but slow and insensible. Mr. Hunt then referred to the works of John Hunter, published in 1778, of Joseph Fox, of Thomas Bell, of Nasmyth, and of (now) Sir Richard Owen, K. C. B. He dwelt upon these points to demonstrate, by means of the dates given, the slow and unfolding of the truth in the past. As relates to our calling, antiquity has given us nothing, except what to avoid. Now the torch seems fully ablaze, and the world has been further enriched by the publication of the works of Messrs. Tomes (father and son) and some other valuable publications which will occur to us all. Moreover, "a wave of progress" has reached this country from the other side of the Atlantic which has had its stimulus upon us, and has raised an increasing demand for, and appreciation of our services.

To education, broad as well as technical, Mr. Hunt looks for the elimination of the false and worthless from our ranks, rather than to all the acts of Parliament that have been or ever will be. Next, therefore, to compulsory registration, let us rank the Preliminary Examinations in the subjects of an English gentleman's education, a knowledge of which no man who has any wish to secure social recognition can afford to be without, and which is now happily compulsory on all who shall henceforth enter our ranks.

In truth, he continued, the current of knowledge and improvement rushes on so swiftly that those who hesitate to commit themselves to it will soon be left far behind, and serve only the ignoble purpose of enabling us to measure the force and rapidity of the stream. Our own individual credit, and the honor and reputation of our body, demand that we should not be wholly ignorant of the other departments of the healing art, and in general science, history, antiquities, music, the fine arts, &c., as our individual tastes prompt us, we should be students.

Let us each, then, strain every nerve, not only to advance the branch of the profession we have chosen, but to advance our own individual culture as much as we can ; thus shall we enjoy the greatest pleasure which upright and honorable minds can conceive—that of increasing the *usefulness*, and thereby raising the credit and respectability, of the body to which we belong, and so prepare for ourselves, at all times, a pure source of the most satisfactory reflections.

Mr. W. V. Moore then read a paper on " The Condition of the Tonsils Affecting the Teeth." The gist of the argument was that an unhealthy condition of the tonsils often promotes caries, and also pain and inflammation of the gums. Mr. Moore mentioned cases which had come under his notice at the Plymouth Dispensary, and stated the remedies he had employed.

Mr. Pearman showed two germinated temporary teeth the right upper central and lateral, which he had extracted from the mouth of a little girl six and a-half years old.

Mr. Balkwill related the particulars of a casc of transplantation. In May last a young lady had her first upper right bicuspid taken out because there was not room for the canine. Her mother said, " what a pity it is to take it out —it's not a bit decayed." He said "yes," and added that if her sister had a corresponding tooth which was decayed it would be well to change it. Curiously it was a fact that the corresponding tooth in the sister had been troubling her for some little time, and on looking at the upper bicuspid in thc sister's mouth he discovered that although there was not acually a fistula there was a red place. Under gas he took out the decayed tooth from the elder sister, inserted in its place the sound tooth he had taken from the younger sister, pressed it up and kept it firmly there with his finger for five minutes (he preferred this to any attachment, or plate, or tying it afterwards) told her to keep her teeth tight shut for a time and be careful in eating for the next few days. He saw the case a week later; it was a little tender but doing well. He saw it a fortnight since when it was almost as tight as the other teeth. The threatened alveolar abscess had completely disappeared, any everything was looking as healthy and satisfactory as it could be.

The President remarked that there were numberless cases on record of teeth accidentally knocked out being replaced, not by an educated dentist even, but by bystanders, and there had been actual re-union of the vessels, pulp and nerves. When a tooth was taken out it did not at once die, the vessels had vitality for some hours afterwards.

He did not think there was any necessity to remove the pulp from a living tooth which had lost its connection with its socket.

Mr. Keys said the cases mentioned by the President were of teeth restored to the places from which they had been removed—they were different from the case of a tooth taken out of one mouth and placed in another. He did not think the cases analogous, because where there was a transfer they would never get a perfect fit.

The President said his remarks applied only to healthy teeth. As to the point just raised by Mr. Keys, of course the cases he had mentioned were not quite analogous to the one under discussion, but it must be remembered that not only would teeth grow when transplanted from one mouth to another, but, as was well-known, there was the instance of teeth being transplanted to the comb of a cock where they grew and thrived. The whole question was a very interesting one, and he regretted that there was not time to discuss it further.

Mr. Keys presented a model showing the plan he adopted for protecting pivot holes in plaster models. He had had trouble in putting pivots into gold plates, and the plan he adopted got over the difficulty. The device which he illustrated, consisted of placing a zinc tube over the wires in the Stent's impression, and the tubes being left in the plaster cast protection was given throughout the entire process. The idea, as illustrated by the models, was generally approved of.

Mr. Brown-Mason pivoted a front tooth in the manner referred to as Mr. Sheffield's. Subsequently Mr. Verrier gave his demonstration of continuous gum work, and Mr. Briggs showed Dr. Campbell's vulcanizer and celluloid apparatus.

In the evening the members dined together at the Imperial Hotel.

ASSOCIATION MEETING.

The Fourth Annual General Meeting of the British Dental Association was held in Edinburgh, on August, 28th, 29 and 30th, the Royal College of Surgeons of Edinburgh having kindly granted the use of their Library and Hall for the purposes of the meeting.

The proceedings began with a reception in the Museum of the College, by Dr. John Smith, President of the College of Surgeons, and by the Lord Provost of Edinburgh, Sir George Harrison, LL. D. After luncheon, which was served in an ante-room, demonstrations and exhibits o instruments, &c,, engaged the attention of members ; and in the evening there was a gathering of members and their friends at the Forestry Exhibition.

The second day was devoted to the more important business, commencing with a meeting of the Representative Board, at 9 A. M. Demonstrations also began at the same hour. At 10.30, the General Meeting was begun, Mr. J. Smith-Turner, Vice-President, occupying the chair in the absence of the retiring President, Mr. C. Spencer-Bate, F. R. S.

Mr. John Tomes, F. R. S., President of the Representative Board, had prepared an address which was read at the meeting of the Board, and it was decided that it be also read to the general assembly.

In referring to the lately-withdrawn Medical Bill, Mr. Tomes remarked that the dental section was of advantageous importance to them. One result of its passing would have been the repeal of a provision introduced in the Dentist's Act rendering the consent of the Medical Council a necessary antecedent to a prosecution under section 4 of the Act. The question of direct representation in the Medical Council, so much agitated for by medical practitioners, and in the bill to some extent conceded, was, as respects dental practitioners, brought before the Royal Commission and considered with a result that, taking into account the very recent legal recognition of the dental profession, as such, might have foreseen. While, as the decision of the Royal Commission would indicate, the Licentiates were for the present sufficiently represented, those who held no registrable educational qualification were not unrepresented. Legislation would not, indeed could not, afford a remedy for this evil, but education and association will tend to its diminution; and the increasing prosperity of their dental schools, brought into action by legislation, bade them hope that a professional nuisance which never could be wholly removed would be brought into much narrower limits, and its practice confined to the few meaner spirits whose presence in their ranks might be regretted but could not be prevented. Those who lived on might see, and he would venture to predict would see that, happen what might, their Act if rightly used by themselves, was sufficient, and that the proposed amendments, though desirable, were of relatively small account as respects the general results. No fault had been found with the strictly educational clauses or with the manner in which effect had been given to them by the Medical Council, and therein lay the strength of their social and professional position. If full force were given to these, they might regard lightly the mere prohibitory sections of the Act. Education was the highest form of protection. This secured, its possessor might defy the charlatan whom many contend should be put down by the strong hand of the law. The government steadily refused to make the act of medical practice by unqualified and unregistered persons penal. The most that could be obtained was the prevention of their use of the title of the qualified, their establishment of a claim for for pecuniary remuneration for attendance, or their appointment to any medical office whatever. And with this the medical profession and its dental branch must be content.

Mr. Hutchinson, in the place of Mr. Oakley Coles, read a report of the Dental Benevolent Fund Committee. It was stated that it was in contemplation of the Dental Hospital of London and of the National Dental Hospital to found Scholarships to enable boys who turn out good students to receive free education at these dental hospitals. also that Sir Edwin Saunders, as a trustee, had been instructed to invest the sum of £500, and that he had done so in 2½ per cent. Consols, the sum amounting now to £535 8s. 9d. The report was adopted.

Mr. Parkinson, the Treasurer, stated that their balance in bank amounted to £528. He was sorry to add that they had at the same time 135 unpaid subscriptions for one year, and two years there were thirty subscriptions paid. Mr. Canton, the Hon. Secretary, submitted the fifth annual report, which stated that there was an increase in every direction. Since the last meeting at Plymouth there had been one prosecution—the Association *v.* Halford—and a

Scottish case was coming up in October. During last year another branch had been added to the Association—the West of Scotland branch, this being now the fifth branch. The membership of the Association now numbered 536, showing an increase of 42; and in addition to that six members were elected on the opening day to the Scottish branch, and four yesterday, making the increase 52 members. It was agreed, that the next meeting of the Association should be held in Cambridge, on August 27, 28th and 29, and Mr. White, Norwich, President of the Eastern Counties Branch, was nominated President-elect. The meeting endorsed the action of the Representative Board in removing the name of Mr. Partridge, London, from the list of members, for alleged "disreputable advertising," after remonstrances by the Board. It was reported that a Central Counties Branch was being formed, Birmingham being the centre, and that already a large number of names had been received.

The Chairman then read the President's valedictory address. Mr. Bate observed that he felt no misgivings as to the success of the meeting of the Dental Association in Edinburgh. The Association had within itself all that was necessary to make this a certainty, though the pleasure of the meeting could not fail to be enhanced by the fact of its being held in a town famed both for its literary and scientific societies, and for its poetical and historical reminiscencies. With Edinburgh were associated the names of Goodsir, Blake, Nasmyth, and several others, whose researches into the structure and mode of development of the dental tissues had rendered most important services to that branch of anatomy which formed the special study of the members of the Association.

Directing the attention of the Association to the advantages to be derived from the collection and investigation of some of the many unsolved problems still to be met with in the department of dental surgery, he remarked that the cause of decay of the teeth had been carefully studied by many, and the futility of individual research was well exemplified by the result that almost every inquirer had founde a new theory for himself, each of which was identified with the idea preconceived before he ever commenced to study the subject. It was, then, most desirable that subjects of this kind, which it was important should be set at rest for the benefit of sound curative treatment, should be investigated by two or more kinds in concert. He advocated the appointment of small committees for this purpose. Such a committee working together would, by the division of labor, be able more thoroughly to investigate what had already been done, so as to avoid the republication of observations and opinions which had long since been disproved and been forgotten ; and having thus placed themselves fairly abreast of the most reliable information, past and present, would reserve their energies for really original investigations. Amongst the subjects which might be taken in hand with advantage, besides dental caries, with the best means of preserving and utilizing the roots of teeth after the loss of their crowns by disease or accident, the extraction and replantation of teeth as a means of treating some forms of disease and restoring the teeth to usefulness. Various pathalogical conditions of the mouth also required enlarged inquiry and more extended investigation. A carefully considered report of a series of cases would be of far greater value than the scattered records of remarkable examples, which could only demonstrate the possibilities of abnormal conditions, and did little to advance the present state of our knowledge. Concluding with some remarks on the present state of dental education, Mr. Bate specially deprecated the existing inequalities in the standard required by the different examining bodies for the dental diploma. All feeling of rivalry in this respect should, he thought, be reduced to a minimum. He thought the various examining boards should come to some arrangement with the view of making the standard as uniform as possible, thus doing away with a frequent source of jealousy, and greatly strengthing the the *esprit de corps* of the profession.

The President-elect, Dr. John Smith, LL. D., President of the Royal College of Surgeons, Edinburgh, then took the chair, and delivered his Inaugural Address, He said:—"Gentlemen, on taking the chair at this large, important, and influential gathering, I need not express the sense I feel of the high honor conferred upon me by my election as President of the British Dental Association.' In acknowledging the compliment thus paid me, I have to assure you that I shall do all that in me lies to discharge the duties and maintain the dignity of this distinguished office, and, so far as my abilities permit, endeavor to uphold the honorable and eminent position which the Association has already attained under my able and illustrious predecessors in this chair. The opening address by a newly-elected President at meetings such as these not unfrequently partakes of a repetitionary character—a sameness of construction and identity of topic with those of past years—a ringing of changes on by-gone addresees, necessarily engendered by the similarity of circumstances in which the successive speakers have, from time to time, been placed. Keeping this in view, and knowing that the time at our disposal in the present instance requires to be carefully economized, I shall not detain you any lengthened reiteration of what has been so often and so admirably dwelt upon before. The objects, the achievements, and the prospects of the Association are known to every one now present. I do not, therefore, propose offering any remarks upon the past, nor have I anything original to suggest in reference to the future. To enter npon the past would savor more of a valedictory than an inaugural address; it is for the retiring President to 'cast a long and lingering look behind.' For myself, in the meantime, 'the world is all before me where to choose.' Without, then, presenting to you any prolonged eulogium upon the beneficial purposes of the British Dental Association, upon the amount of good work it has accomplished, upon the great advantages it has conferred, and the important aims and ends it has in view, towards advancing and promoting the interests of the professional body it represents, I have simply, and on all these points, only to offer you the words of unqualified congratulation that such an Association exists and flourishes. We are here to-day as the representative and supervising assembly, and, to a certain extent, as the administrative convocation for the dental profession throughout Great Britain; and being so, I have no hesitation in saying that our influence in such a capacity is felt throughout the world. It may be argued that we already have a Dental Act enunciating the laws regarding dental practice; that long before its existence we possessed at least one great dental school, and one great surgical corporation conferring on the students of that school a high and much sought-after distinctive dental qualification; that at the present day we have many additional complete and reliable schools of dentistry, and a full and recognized dental qualification conferred in each of the three divisions of the kingdom; that over all these we have a court of supervision, provided in the General Medical Council, and a safeguard and guarantee against illegal practice and pretenders in the *Dental Register;* and that, in the face of such a state of matters, little seems left for an Association of this kind to do. The answer, however, is, that by the various schemes referred to—the means and appliances—the machinery for education, examination, and qualification has been provided; but it requires some effective power to render such machinery available, and to ensure the work it is intended to perform being done, and that such work shall be done thoroughly; and, besides this, that an opportunity shall be afforded for the collective voice of the profession being heard on all the different questions it may hold to be important, that the interest and privileges of its members shall be effectively maintained, and that the laws provided for such purposes shall be enforced and carried out in their integrity. These appear to be the functions and administrative duties of an Association of this nature; and without some such representative vicarious authority as it constitutes, mere legal enactments are liable to become unexercised and of no avail.

While, however, this Association has these important duties to undertake and to pursue for the profession, it has also a duty to perform to itself. It has to keep in mind the onerous reponsibility for which it is liable officially to be held answerable in case of its actions being a failure —incurring unpalatable expenditure—or exceeding its functions or its powers. In cases of transgression, hardship, misdemeanor, what seems the proper course of action may in the abstract appear a simple matter to be put in force. But when this comes to a practical application in an exact and rigorous form, care requires to be exercised that no despotic over-riding of collateral and unexpected difficulties be attempted, rashly or indiscreetly, until these are met; as it need not be said that any proceedings taken by the Association or its representative board are much more likely to be successful by waiting till the line before it be pronounced all clear and safe, than by rushing on at express speed with some danger signal flaring in its face. Precipitate impulsive measures have nothing to recommend them. A prudent exercise of caution and determination will no doubt bye-and-bye make the Association 'a terror to evil-doers and a praise and protection to those that do well.' But while one of the main objects of the Association is to act for and to exercise a certain amount of jurisdiction over the profession—purposes which, when judiciously handled by means of its executive, namely, the Representative Board, become a vuluable and powerful element of control the British Dental Association, unlike other purely governmental bodies, has reserved to itself the privilege of establishing and maintaining the means of promoting friendly feeling as well as scientific intercourse among its members. It has done so by the establishment of a Benevolent Fund, by its great statutory and ever-acceptable periodic gatherings in different and distant centres of professional life throughout the country, and by the publication of a journal devoted to the literature of dentistry, and ever open to the community but serves to foster and facilitate the acquirements, the abilities, and the recording of the experience of every individual member composing it, according to the energy with which he may avail himself of the great and numerous advantages placed by it at his disposal.

It is, then, this great and beneficial association which I have now most cordially to welcome on the occasion of its meeting here in Scotland's capital—the city of Edinburgh. You are here as men pursuing and promoting the interests of science, faithfully forwarding the specialty to which your lives have been devoted. But I have to congratulate you, particularly the Southern strangers to our city, that such laudable pursuits have this year served a double purpose, and brought you to the 'stately Edinburgh thronged on crags.' I need not remind you of the romantic history, the features of picturesque attractiveness and natural grandeur, the monuments of antiquarian interest, the footmarks of a former age of splendor and renown, possessed by the city you are now honoring with your presenee. It is to no mimic scene to which you are introduced, no mere panoramic exhibition in which you now will walk. The actual scenes of old romantic legends and old associations will surround your steps on every side. A checqured history, broken as the memory of dreams, hangs over every shrine to which you may do homage. From the castle's rugged battlements and hoary towers, where kings were born and nobles pined and died, away down to deserted Holyrood, linked with the fate of Mary, fair but hapless Queen of Scots, and Prince Charles Edward, names as enduring as the time worn 'Crags' and Lion Hill, keeping their weird watch and ward high over all, there is scarce a quaint or tottering edifice but has its own most wild or woeful history.

Having referred to the customary excursions being perhaps less necessary from Edinburgh than from any other city, Dr. Smith concluded:—A long array of great historic names, now low in the dust, once peopled the wynds and closes of that picturesque stretch of lofty habitations from where

The castle holds its state,
And all the steep slope down.
Whose ridgy back heaves to the sky,
Piled deep and massive, close and high,
Mine own romantic town.

These, I say, will, all in their own subordinate capacity and in the event of time permitting, lend an additional interest to your meeting here, and while such relics of a by-gone time suggest their own reflections, there is no want of more modern attractions in the legal, educational, eclesiastical, medical and charitable monuments of interest throughout the city to while away a leisure hour, and of which our law courts, our University, and our immense Infirmary may help to serve as types. And, now, gentlemen, offering you these remarks, I shall not detain you longer, nor further interpose between you and the more interesting business which lies before this meeting of the British Dental Association in Edinburgh.

Mr. Reid, L. D. S., Edinburgh, read a paper on "The Application of Dental Science in the Detection of Crime." Medical Jurisprudence occupied a wide field in the detection of crime in its varied forms, but in that part of it which might be termed dento-chirurgical jurisprudence it was narrowed down to the point of identification. While in several instances medico-legal evidence had been at fault, and a verdict of mistaken identity followed a lengthened and carefully-conducted trial, he had failed in finding on record an instance where the proof of identity brought out by the aid of dental science had been set at naught.

Mr. Henry Sewill, M. R. C. S., L. D. S., England, read a paper on "The Prevention of Caries." He said that caries was impossible without acid, and without vitiation of the secretions of the mouth. Without due exercise in mastication teeth could not easily be kept clean, and where the function was impeded by the presence of tender teeth, these should be brought into a healthy state or extracted

Crowding of the teeth greatly prevented the constant beneficial rubbing and polishing of them, prevented the ready access of alkaline saliva to those surfaces where acid-forming substances find their location. He was afraid they could not hope that for the sake of the teeth of posterity men would be advised to pick out big-jawed wives, but they could at least seriously impress hygienists with the fact that the human jaw needed adequate use for its due development, and that no dietary could be perfect which was composed of uniformly bland and soft substances, calling for little or no mastication.

Mr. W. Campbell, L. D. S., England, Dundee, read the next paper on " Fractures of the Inferior Maxilla," illustrated by diagrams shown by the oxy-hydrogen light, and gave a successful demonstration of a new splint which he had devised and used in some cases in the Dundee Infirmary in treating fractures of the lower jaw.

Mr. G. W. Watson, L. D., Edinburgh, read a paper on "Antral Abscess." He enumerated the common causes, and the treatment he adopted, which was removal of diseased tooth and roots, washing out antrum with warm water, and afterwards with weak solution of permanganate of potash.

Dr. T. Stack thought the great majority of fluid diseases of the antrum arose from diseased teeth, and that though syringing with tepid water was good, usually some medicinal agent sholud be added to it.

Dr. Walker, M. R. C. S., L. D. S., England, read a paper on " Educational Centres." It was a notable fact that the population of Germany was more highly educated than that of the British Isles. Was this fact always to remain a standing blot in the history of our country? If not, what means could be adopted to make it otherwise? The British Dental Associatian might be one of the means to correct this general stagnation by considering the character of the primary and general education of their sons, and the result of public education in contradistinction of private.

Mr. J. R. Brownlie, L. D. S., Glasgow, read the last paper on the "Prevention of Irregularity." He said that while a regular arrangement of the teeth as a result of nature's handiwork was common enough, dentists were frequently called to see the results brought about by certain other forces acting at variance with those named, giving to the teeth a crowded arrangement which was a blemish in the mouth of beauty, and which was an important factor in the production of dental caries. The age at which prevention could be carried out was a very early one, a much earlier age than dentists usually had the opportunity of applying their knowledge. One of the earliest habits a child acquired giving rise to the deformity was that of sucking the thumb. Closely allied to this was the improper use of the feeding bottle. Next there was the possibility of the teeth of the first set becoming a cause of irregularity to those of the second. He also took occasion to refer to the practice of people setting no money value upon the services rendered and time occupied in consultations. An operation, he said, in itself so simple that the very veriest clown could hardly blunder, was credited with a money value, and the fee readily paid, while the special knowledge which had to be acquired by years of study, and which alone enabled one to deal intelligently with the conditions of the mouth, was set at naught too frequently as a thing not worthy of any recognition. Indefensible throughout, the practice was one which was essentially objectionable in regard to the case of children's mouths. If a dentist knew beforehand that on his decision would rest the question of fee or no fee, it was too much to expect from human nature that his decision would be free from bias, and founded purely on the merits of the case. The temptation was too great. If it were a question of the extraction of a temporary tooth, the operator should more than likely do what was wanted done by the parent, who was quite incapable of forming any inadequate opinion of its ultimate effect upon the mouth. Was it possible that under such conditions the opinion could be founded purely on the merits of the case? The position could not be defended, and there were but few of those parents or friends who interested themselves in the subject who were not capable of recognizing the risk to which the interests of the child were exposed, and with whom a word or two of explanation was all that was needed to secure to the operator unreservedly an opportunity to act or abstain from action *secundum artem.*

Mr. Balkwill urged that the teeth determined the position and form of the alveolus, and advocated the retention of the temporary canine as long as possible. He desired statistics of effects of premature removal of temporary teeth, and related a case in which the second deciduous molar was extracted and he did not anticipate evil results.

Dr. Williamson remarked that thumb-sucking affected only the front part of the alveolar arch, and also mentioned lip sucking as an item not mentioned by Mr. Brownlie. He alluded to an instance of the latter habit in which considerable hypertrophy of the lip ensued, and which eventually had to be removed.

Mr. Watson directed attention to two cases in Museum of the Odonto-Chirurgical Society, in each of which the deformity was caused by thumb-sucking.

Mr. Campbell mentioned two cases in which an upper and a lower bicuspid were retarded in a boy and a girl, æt. 13. By pressure upon the gum over the absent teeth they very shortly afterwards appeared.

Dr. Stack urged the retention of the temporary teeth, especially of the lower canine. He also remarked that if dentists put down their foot firmly, and said there shall be no consultations gratis, then, and not till then, would the practice complained of be given up.

Dr. Cunningham said that the public must be taught to know that it was for time and skill and medical advice, and not for a mere mechanical operation, that dentists were paid their fees.

A meeting of the subscribers to the Benevolent Fund was also held; and in the evening the members dined at the Waterloo Hotel, the Lord Provost being among the guests. —*London Dental Record.*

ARTICLE II.

ON THE INFLUENCE OF MICRO-ORGANISMS IN THE PRODUCTION OF CARIES.

BY ARTHUR S. UNDERWOOD, M. R. C. S., AND L. D. S. ENG.

Lecturer on Dental Anatomy and Physiology at the Dental Hospital of London Medical School, etc. *

(Read before the Odontological Society of Great Britian, April 7, 1884.)

Mr. President and Gentlemen:

Mr. Milles and myself have so much to lay before you to-night in the form of evidence concerning the part played by micro-organisms in the production of caries, that we feel confident you will excuse us if we go straight to the matter in hand without an unnecessary waste of time in the form of preamble.

It is, however, necessary to state that we only propose to discuss the purely pathological side of the question to-night, and that only so far as the dentine alone is affected.

As we stated in 1881, we still consider that the initial stage, that is, the enamel destruction, is probably little more than a chemical solution of the tissue by an acid or acids; but we are inclined to believe that the greater part of such acids are the result of fermentation, a process which is entirely dependnet upon micro-organic life, as has been amply proved by Pasteur, Lister, and others.

As the result of the decomposition of albumenoids, numerous substances are formed in the mouth—peptones and other similar bodies, fatty acids, acetic, formic, butyric

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*By the courtesy of the author, and with the special permission of the Society, we are furnished with corrected proof-sheets of the *Transactions of the Odontological Society of Great Britian*, for April, containing the above paper. The discussion that followed the reading of this paper we hope to give in our next number.—ED.

malic, lactic, &c., and in some cases sulphuretted hydrogen and ammonia are produced by the vegetation of micro-organisms.

A very simple illustration of this fact is obtained by filling two bottles with neutral saliva and bread, and rendering one aseptic, either by adding carbolic acid or boiling, or any other process of the kind. The micro-organic growth which will take place in the impure one will produce a large quantity of acid; the pure one will remain neutral. The most constant source of an acid reaction in the mouth is undoubtedly micro-organic fermentation.

This is not, however, the main subject of to-day's paper, and therefore we shall content ourselves with this passing allusion to it.

We cannot, however, refrain from expressing our gratification at the careful attention this subject has received from the profession, both here, in America, and on the Continent. Professor Mayr has worked out the chemical aspect of the question with great care and exactness; Mr. Tomes has done much in the direction of the effects of organisms in soft tissues of the teeth; Mr. Spence Bate has given us many valuable suggestions in his able and exhaustive summary of dental science at Plymouth last year; Mr. Sewell has thrown our valuable conjectures upon the remote etiology of caries; and Dr. Miller, of Berlin, has done an immense amount of microscopical work, contributing a large array of evidence,

We have not been able untill now to present our new views in full, because many of our experiments required a ong time to verify and confirm; some afforded perplexing and almost contradictory results, requiring a long time to clear up and involving much repetition, and we may add, in explanation of the apparent delay, that what takes but little time to write or say often requires months and years of disappointment and patience to work out.

In the autumn of 1881 we were only justified in speaking with any amount of positiveness upon one point, namely, the actual presence of micro-organisms in carious dentine. This one fact, and the evidence in support of it, formed the body of the paper we ventured to present to the International Congress. Micro-organisms were found in every fragment of carious dentine of which we cut sections, and we had cut immense numbers; the leptothrix of Lebel and Rottenstein was, we found, a superficial growth.

Another fact of scarcely less importance, but one supported by far less evidence, was that the agencies to whose action caries had up till then been attributed by a large majority of scientific opinions, namely, certain acids, were unable to produce any such changes upon teeth exposed to their action alone, although the enamel protection was removed, and the acids employed were those present in the mouth. We had read many allusions to caries produced in teeth out of the mouth by artificial means; we employed the means indicated (whenever they were indicated, which was rarely,) with the addition that we did so under absolutely aseptic conditions . we repeated the experiments, and the results of (in some cases) years of exposure was that no change that we could detect took place. Here was a second, but a negative fact.

The third fact obviously required was a positive one; it remained to inoculate dental micro-organisms into the flnaks add observe the result. We did so, and the result was change in the exposed dentine, but so slight that we could not succeed in cutting a section; still, at the time of our paper of 1881, we firmly believed this change, when allowed to become more intense, would prove to be caries. Of the third fact we felt bound, however, to speak very cautiously, and for the last two and a half years we have employed every means in our power to clear it up—with what result we shall endeavor to make plain to you to-night

We are anxious that you should keep clearly before you four main issues, upon which all the theory which we suggested to you in 1881 depends.

1. That certain forms of micro-organisms, namely, micrococci, rod-shaped oval, bacteria, and short bacilli are invariably present in carious dentine.

2. That these micro-organisms extend into the tissue as far as does the caries.

3. That no agents can be made to produce a change resembling caries in the absence of such micro-organisms, i. e., under asceptic conditions.

4. That under septic conditions a change can be induced which, although we are not prepared to call caries, does in some particulars resemble it; teeth in which this change has been produced we shall submit to you to-night, and also, suggest to you why we hesitate to call it caries.

These four points once established upon reasonable evidence, we shall ask you to consider whether we are not justified in deducing from them the conclusion that micro organisms play an important part in the productiou of the disease as we see it and are called upon to treat it, and that their active presence is an absolute essential to its production.

We may add, incidentally, that we never suggested that no other agency assisted in the process, although a recent writer attributes some such absurdity to the advocates of the germ theory. We do not consider ourselves justified in wasting your time over such a digression. The first point to discuss, then, is the constant presence of micro-organisms in carious dentine. Upon this point the evidence submitted to the profession by us in 1881 was very strong. We were then able to state that, since we had succeeded in properly cutting and staining sections, we had always discovered mibro-organisms. The appearance was not caused by softening agents, because the teeth were cut fresh and immediately after extraction. The number of sections cut by us between 1879 and 1881 was so great that we were convinced that the phenomenon was constant.

Since then, Mr. Charles Tomes has, we believe, made some investigations which have led him to concur in this constant presence.

Dr. Miller, of Berlin, has cut a very large number of sections of carious dentine, with a result which is completely confirmatory of our assertion that micro-organisms are invariably present. In fact, this point has been confirmed by every careful observer, and may be considered to be completely established.

The second point is very much more difficult to decide—the more so because statements have been made upon this point which tend very much to confuse the mind of the reader. It has been stated by Dr. Miller, who has written a very large number of papers upon this and kindred subjects during the last two years, that there is a zone of softened dentine of considerable width, not affected with micro-organisms, separating the normal dentine from that which is so infected; and further, that the outline of this area of softened dentine does not correspond with the outline of the area infected with organisms. We have attempted to verify this observation, but we have arrived at the conclusion that if there be any such zone at all we cannot believe it to be of any considerable depth, as we have not succeeded in finding any softened tissue that did not contain micro-organisms. Having regard, however, for Dr. Miller's reputation as a careful and conscientious explorer, we do not desire to attach too much weight to negative evidence; later on we shall suggest some weighty positive evidence on this point. With regard to the outline, we have invariably found the outline of the changed tissue to corrrepond with that occupied micro-organisms, and we feel less hesitation in doubting this latter statement of Dr. Miller because he claims to be able to compare these outlines with the naked eye, unaided by any instrument. We think that this is too rough a test for objects whose greatest measurement does not exceed the one-one-thousandth of an inch.

There is no doubt that it is easy to establish a line of demarcation with the aid of a sharp instrument between tissue that you can easily prick and that which is quite hard; this line no doubt corresponds very nearly to the edge of the disease. We have also come to the conclusion that corresponds very nearly to the edge of the micro-organic invasion; that is, we have cut sections as near as we could to the healthy tissue and found them infected. We do not, however, attach so much weight to this fact as to be following experiment, which we think must be absolutely conclusive.

Before we can explain its full weight we must enter into a few details of the method we employ to grow and cultivate special germs. We used to make a meat infusion, boil it, introduce it with antiseptic precautions into asceptic test tubes, and seal the tube with wool. If the fluid remained clear we knew it was pure; if it become turbid within a day or two we knew our precautions had not been complete, and some germs had been introduced accidentally, and the tube was of course useless. If we wished to grow a special germ we rubbed a purified probe against the infected spot, and introduced it into the fluid, replaced the wool cap, and the ensuing turpidity denoted the growth of the germ. The objection to this plan was that the turpidity spread through the entire fluid, and if we had, despite our precautions, introduced any other organisms besides those we specially intended to introduce, they all become inextricably mixed in the ensuing putrefaction, To obviate this, we adopted Koch's plan of adding gelatine, and instead of a pure fluid, making a pure jelly: when this inoculated in a particular spot the growth was confined to that spot, and if anything else dropped on the surface of the jelly it grew there quite separate. Under these circumstances we noticed that different forms of germ grew in quite different ways—some, for instance, forming a white ball, others a mass of spiculæ, others wavy lines; these peculiarities of growth could be easily reproduced in other flasks by a second inoculation, until we found it quite easy to separate each variety and grow it by itself without any extraneous growth to confuse the result. We have brought down some flasks, with growth going on, to show you to-night Well, we proceeded to inoculate flasks with those deepest portions of softened tissue which formed the most outlying layer of changed dentine, and we found that from these portions a growth of organisms proceeded, proving beyond doubt that organisms were contained in the pieces inoculated. This is not a doubtful experiment; it absolutely demonstrates that the deepest portions of the softened tissue contained organisms, and if there exist any zone of alterations beyond them it is so microscopically narrow that we have not been able to detach a fragment of it.

We do not, however, deny that there is a great probability that the advance guard of micro-organisms may be surrounded, and, *to a microscopical extent only*, preceded by a softening, the result of the action of those acids which they themselves produce. We shall be able to show that they do generate acids capable of softening dentine, and therefore we should expect to find this effect slightly in advance of their presence; but this is hypothesis merely. We would further add that the transition from very carious tissue to that which seems quite healthy to the eye and the touch is, in the greater number of cases, more sudden than is generally supposed, and allows but little space for this non-infected zone. To convince oneself of this, it is only necessary to split a number of carious teeth and prick the surfaces. One more fact should be borne in mind in this connection, namely, that healthy dentine softened by a weak acid does not look different under the microscope from healthy dentine cut fresh, and it is therefore impossible to detect the softening microscopically; the tubes are not larger, nor are they irregular, as is the case in carious dentine—in fact, the existence of such a softened and uninfected zone separating the infected from the non-infected dentine is s matter so difficult to demonstrate that we do not think much value is to be attached to it.

We now come to the third point, viz.: that it is not possible to produce caries, or anything resembling it, by subjecting teeth to the action of acid fluids, in flasks out of the mouth, provided the flasks be kept in a strictly asceptic condition. We do not think this point has ever been disputed, and, we feel in position to state that the evidence upon which it rests is incontrovertible; but, before discussing it, and the point that follows it, we think it will not be a waste of time to explain what we mean by a change resembling caries. We mean a change by which the tissue affected is made distinguishable from that which is normal to the naked eye and touch or under the microscope. To the naked eye it must become discolored—we only mean changed in the color, and not necessarily brown; the surface loses its polish, or, if moist, the affected part must be separable from the healthy with an instrument; to the touch it must become softer; under the microscope the channels must become dilated at the expense of the matrix. In 1881 we exhibited several flasks in which infusions of meat and saliva containing malic, butyric and other acids had been allowed to act upon exposed dentine for periods varying from one to three years; the teeth were liable to caries because they had suffered already from it; healthy portions were denuded of enamel and partially protected by wax, a certain part being left exposed with no perceptible result whatever. Of course a strong acid, or a large amount of acid, would decalcify the tooth, but this does not resemble carious change.

These experiments were sufficiently numerous and conclusive to warrant us in passing on to the fourth point of this investigation, and this will detain us longer than any of the others, as it is in this direction that we have experienced the greatest difficulties and the most perplexing results.

We were so fully alive to the overwhelming difficulties attending any attempt to reproduce out of the mouth the complicated conditions existing therein, that we should have felt anything but sanguine but for a curious accident that encouraged us to proceed in this direction. We will therefore commence by telling you the particulars of this accident.

At the Congress in August, 1881, we exhibited, among other flasks, a series intended to illustrate the fact that no change resembling caries could be induced upon the surfaces of teeth hnder aseptic conditions. The flasks all contained an infusion of meat and saliva with malic and butyric acid and teeth susceptible of caries, the surfaces ground down to expose the dentine, part of the exposed surface being protected with wax, so that any loss of substance could be at once detected in the exposed part. Now these flasks, which were labeled i, iii, iv, v, vi, had remained perfectly pure from the time they were put up, June, 1880, till the Congress, August, 1881, that is, fourteen months, and no visible change had taken place in the exposed surfaces. In taking them home in a bag, flasks, i, iv, and v fell down, allowing the fluid to come in contact with the cap covering the flasks; iii and vi remained upright.

In the course of a few days, flasks i, iv and v, which had tumbled down, became turbid; iii and vi remained, of course, pure. By the 5th of December, 1881, iii and vi were in all appearances, as before, unaltered; but the teeth in i, iv, and v were already discolored brown; moreover, the discolored parts were on the surfaces slightly softened, and although the change was so shallow that we could not obtain a good thin section of it, we could see that we could not obtain a good thin section of it, we could see that the tubes were enlarged and contained a material that stained readily, which, owing to the thickness of the section, we could not, unfortunately, identify. Now, whatever this change was, it was manifestly dependent upon the introduction of organisms; nothing else was introduced. Fourteen months' immersion in ths fluid, when asceptic, failed to change the teeth at all; four months in the same fluid, plus germs, produced a change; the same additional four months, in the sister flasks, produced no change at all This seemed an important addition to the facts in our possession at the Congress. The next stage was less satisfactory; the change did not seem to progress; do what we would, we could not produce a considerable change. We conceived that this might arise from the fact that several important conditions favorable to the activity of the germs in the moutn were absent in the flask. First, the temperature of the body; second, opportunities for lodgment; third, constant renewal; fourth. unlimited and varied pabulum; we threfore contrived a very elaborate experiment in which we proposed to assemble all these conditions. and as many more as we could think of. We erected a large incubator, which we kept continually at the temperature of the mouth; it was divided into an upper and a lower story, which communicated by an aperture. In the upper story was a small bath with a tiny tap contrived to drip drop by drop through the aperture into a second bath in the chamber below; this again dripped into a receiver, the fluid being thus kept in constant circulation through the mindle bath. In this middle bath were placed some teeth set side by side as in nature, the roots being implanted in a block of hippopotamus ivory, and weak points created in the interstitial parts with the burring engine, the size of the burr being kept to test any enlargement of the holes, and some other implanted in wax. The upper bath was then filled with saliva, milk, bread, decaying teeth, meat, etc.; while some fragments of the latter were inserted about the teeth in the middle bath. The lowest receptacle was periodically emptied, while the top one was periodically fed. Without troubling you with more details, we thus contrived to assemble the proper temperature, the pabulum movement, and the normal disposition of the teeth. Now six months of this highly unsavory experiment produced scarcely any perceptible change, except that all the tissues became black, the hole drilled, in the blocks and the teeth were the same size, and their edges were not a bit softened. The putridity of the baths was, however, so offensive, that it with some relief that we decided to abandon this particular experiment. We saw that some great essential condition was absent, and though a longer period might doubtless have produced slight changes, my health and appetite suffered from the constant exposure to all these putrid smells, and we agreed to stop the incubator; but this experiment, though apparently a failure, led us to what we conceive to be the true solution of the difficulty. So far we decided only that some essential factor had been omitted.

[TO BE CONTINUED.]

ARTICLE III.

ON THE TRANSPOSITION OF CERTAIN FUNCTIONS OF THE TEETH.

BY J. EDW. LINE, D. D. S., M. D. S., ROCHESTER.

A glance at the species, varieties, individuals of the animal kingdom, is sufficient to convince even the casual observer that teeth have several functions, the chiefest of these being what is conceded in the case of most, if not all animals, the mastication of alimentary substances. And by mastication we do not mean merely the trituration, but also the seizure of food, its laceration, division, which are but a few of its many modifications. Animals whose food is derived from the vegetable kingdom grind, triturate, reduce to a fine, and in some cases the finest possible, condition all food fit for alimentation and whose appointed end is the maintenance of their own economy. It is retained, as a rule, in the cavity of the mouth until its every particle has been exposed to the mechanical action of the teeth and the solvent effects of the secretion of the salivary glands. And this, in the case of the vegetable feeders, is a very necessary process; for without thorough mastication and insalivation, the reduction of the starchy matter in which such food abounds would be incomplete, and as consequences of such incomplete reduction, other and remote organs would be required to perform work the quantity and quality of which would overtax them and their resources; or the food would be rejected or voided nearly or quite, as replete in nutritious ingredients as when first ingested. In the case of the flesh-eaters the insalivation of food is of little consequence further than the wetting, oiling, greasing of the mass to aid it in its passage to the more distant digestive organs; but the tearing, cutting, in a word full of meaning, the *mangling* of the food, is of the greatest moment; for by this process the surface subsequently exposed to the secretions of the several organs is many times multiplied and the mass more readily acted upon preparatory to its assimilation. It is thus seen that mastication is an important function, and the further pursuit of the matter would add little to the plain statement, that so far at least as the lower animals are concerned, work is the primary function of teeth and those other parts that go to make up the dental apparatus. But teeth have other functions which are said by the comparative anatomist to arise " out of the relations of co-existence with other organs and endowments, or from a special development of the organs themselves." These functions are termed secondary, and may be briefly mentioned as exhibiting themselves in speech, as ornaments, as discoverers of age, as characterizing sex, as weapons of offence and defence, as a means of anchorage, as implements of tranport (—*Owen*); but the greatest of these, greater even than mastication, in the civilized member of a civilized community is ornament or personal adornment.

But before going further, and that we may get at the subject in form for discussion, we submit the following propositions: 1st.—Among animals, other than man, mastication, including the several modifications already alluded to, is the primary function of teeth. 2d.—Among a very small proportion of animals other than man, and in fact including the lower orders of men, ornament or personal ornament is a secondary function.

Enough has been said upon these two points to show much, if not everything, in their favor, hence their dismissal here and now. Then we have 3d.—In civilized communities of men ornament or personal adornment is the primary, and mastication a secondary function. 4th.—This transposition of function is more or less complete, and always directly as the civilization of the individual and the community of which he is a factor.

That our third proposition is true we cite a number of facts that as dentists we are daily compelled to face: In the first place we meet with children to the care of whose teeth not a thought is given by the parents till the anterior teeth show the familiar green stain, begin to decay, or melt away before solvent secretions the nature of the action which is much guessed at, but continues as yet quite unknown. The thought of looking into the child's mouth to note the condition of teeth ordinarily out of sight, unless lead to it by an aching member, occurs to so few parents that each of us could, in all probability, count such families in our practice once around the fingers of both hands. That it is looks, not use, that is uppermost in the parents' mind, is evident from the frequency of the request to remove the stain from the child's front teeth,- "just those four, you know." How the child eats is of secondary importance; how he looks, primary and vital.

Again, we are called upon by, say a well-dressed and (her teeth excepted) refined (?) woman, with the request to examine her teeth preparatory to an appointment. Her teeth are clean, as clean as a stiff brush and coarse (or fine, as the case may be) powder vigorously applied at long intervals, can make them; but with this clean state of the teeth we find abnormally red and swollen gums, with patches of lacerated tissue dipping down between the teeth. At the first view of the case we say—Hard brushing at long intervals, rather than the better rule of little and often. Her occasional respect for herself, and the commendable desire to show us a little of that same commodity, are appreciated at their full value; but the words all but escape us, "Brushed for the occasion." At home, no thought of teeth if they give no trouble; abroad, they must correspond with articles especially donned for show; their function for the time being is ornament or personal adornment. And again, how often do we hear the half-formed determination to let fillable or irregular, but otherwise good teeth go, that their owners may confessedly obtain artificial teeth free from the blemishes of decay, or misplacement in the alveolar portions of the jaw. And who among us has not from time to time extracted by request a somewhat troublesome but fillable back tooth, simply because it was a back tooth, and for a person who would suffer for days, perhaps weeks, rather than part with one from the anterior portion of the jaw? The almost daily request to fill the front teeth with gold and the back ones with something cheaper, is off the same piece—teeth primarily for looks, incidentally for use.

Our fourth proposition, that this transposition of function is directly as the civilization of the individual, seems to us to be closely related to the self-evident. Among members of the lower orders of men teeth are as, a rule, regarded as of value because of their usefulness in preparing for further digestion and for assimilation the various articles used as food; and the more labor involved in the preparation of such articles of food, the greater the value attached to these with us much abused organs. To repeat—low down in the scale of civilized beings teeth are valued for what they do, and not for what they appear; but as we ascend in the scale, less and less importance is attached to their usefulness, and more and more to their investment with what belongs to decorative art. It will thus be seen—must be seen, it seems to us—without any attempt at argument, that teeth when viewed from the utilitarian standpoint, belong to the savage and his compeers in civilized life who have not yet arrived at angelhood; while from the æsthetic standpoint their. primary function ranks with human hair. In other words, and to repeat our proposition—this transpositoin is directly as the civilization of the individual and the community in which he lives, and is becoming more marked day by day.

Having stated the case, it is now no more than fair for us to indicate the causes that have contributed, and are still contributing, to this change. It is not necessary to go back to the physical and mental activities that have led to the invention of reducing and refining apparatus and methods, whereby the food of civilized man is prepared for the stomach long before it reaches his mouth. We have this product at hand, and *must* use it—must, for there is no alternative. We would not go back to the ways of our remote ancestors, nor even to those of some of our unfortunate neighbors; and more than that, the demands of modern society are such that we could not do so if we would. Vegetable food is softened and chemically changed by cooking, so that to be saturated with saliva for digestive purposes, it needs only to be retained in the mouth a short time, rolled from side to side by lips, cheeks and tongue, and occasionally mashed by the ever-moving lower jaw; while animal food, in addition to its being thoroughly cooked, is cut, sliced, shaved, chopped, by the help of a knife and fork, till the surface made ready for the direct and solvent action of the gastric juice, is commensurate with that of a plate of that mysterious something very properly called hash. Here we have not a division of labor, but worse—worse for the teeth,—a shouldering of all labor, first on the furniture and methods of the kitchen, and secondly, on the stomach and more remote digestive organs—the mouth and its dental contents being a mere hole in the wall, a sort of rapid transit from Bridget to belly. In some cases there is compensation for this—for instance, in those persons who grind their teeth at night, or while at work during the day; and also in the educated tobacco chewer, the preservation of whose teeth is due less to the antiseptic effects of the weed than to the exercise necessary to its artistic manipulation. It is thus seen that work is essential to the making of good teeth, also to the keeping of them good. Exercise makes a tooth, as it does any other organ, hungry. Hunger means a right condition of the tooth to appropriate a right quantity of a quality of nutritive material, and that a tooth in this state feed itself, it is only necessary to place this material within the tooth's reach. This view of the matter may be fairly regarded as an illustration of the principle of natural selection—the animal as conditioned by his environment, teeth in their relations to the work they are called upon to do and the nutritive material by which they are fed and sustained.

But there is another cause, or set of causes, that plays a part in this transposition of function. and which falls under the head of sexual selection. The male element in the community, and quite as often or oftener, the female, marries for wealth, position, influence; but never without taking into consideration the personal make-up of the other person. Blemishes of physique, or of mind, are always against the person; but not necessarily to the extent of his or her rejection. Except for the advantages named, a representative of either sex would not, other things being equal, pair with an actually, or even prospectively, toothless representative of the other sex, if the choice lay between teeth and toothlessness. A young girl without incisor teeth of some kind, is, from an æsthetic standpoint, unsightly, unattractive, and as such would be severely let alone by the marriageable and marrying young buck, provided he could find a toothsome and toothful young girl who could, in this and in all other respects, meet the requirements of his special case. The result in this instance would be a strain from ancestors possessing teeth, with reasonable hope of teeth in the offspring; while in the case of said young buck and the toothless girl, the progeny would inherit from the parents a tendency to teeth modified by the further tendency to early loss. But our young girl without teeth, or with bad teeth, is equal to the emergency—is not to be left; and knowing some of the advantages of a good looking mouth, and how much sometimes depends upon its possession, she applies to us for that she has not, or for better than she has, carries out the deception, propagates her kind, and hastens the day of the extinction of those parts of the human frame, repairs on which enable us to provide for ourselves and those dependent upon us the ever welcome bread and butter.

A recapitulation of what we have said leads to conclusions somewhat as follows: that mastication was, and with some grades of men is, the primary function of teeth; that ornament or personal adornment was a secondary function of human teeth; that in civilized communities this order is now reversed—ornament or personal adornment having become primary, mastication secondary; that this transposition of function is directly as the civilization; that the causes leading to the suppression of mastication are such as fall under the head of natural selection; that the causes leading to the advancement of a secondary function to the first place in the list of functions of the teeth are attributable, in the main to several selections, incidentally to the talent and talent and genius of the dental profession.—*Odontographia Journal.*

ARTICLE IV.

MUCOID OR PURULOID ENGORGEMENT OF THE ANTRUM.

BY JOHN S. SMITH, D. D. S., OF LANCASTER, PA.

Mrs. H., aged 24 years. was brought in consultation to me in August, 1883, by her dentist, Martin Musser, D. D. S., of this city.

The patient had suffered for a period of nearly two years with neuralgia and periodontitis at times in her left upper jaw and face. The pain was at first felt in the pulp of the first bicuspid tooth; the pulp was subsequently devitalized, and the canals filled with a temporary filling. For certain reasons the operation was not completed with a permanent filling. The case came into Dr. Musser's care, who finally extracted the tooth, which gave no relief. The face continued swelling, the pain became unbearable, and it was concluded to consult other advice.

I made a thorough ezamination of her mouth and teeth upon the affected side. The gums over and around the first and second molars were inflamed. These teeth were filled with large gold plugs, which occupied the crowns, and on percussion, with an instrument showed some degree of pain, the wisdom tooth was missing, having not erupted. Suspecting diseased condition of the antrum, my attention was directed to the nares of the affected side, which was found free from moisture.

There was noticed a discharge of a mucous nature escaping from the inner canthus of the eye; the conjunctiva was inflamed, with an intermittent flow of tears over the lower lid; the sight was somewhat defective at times. The patient showed symptoms of a marked anæmic condition; had lost in body weight; appetite poor; the pain was intermittent; when it was the most severe she located it under and back of the orbit, and in the body of the cheek bone; here the pain was characterized as a dull sensation, and at times producing a fullness as though the face would burst

Further examination revealed uniform fullness over the region of the antrum, and slight fluctuation upon pressure, and tender to the touch; the skin presented a bluish red appearance with a number of rose-red and purplish-colored spots scattered upon its surface. This condition was more noticeable when the pain was greatest, thus showing the deep-seated congestion of the parts involved.

Diagnosis.—The foregoing history of the case was sufficient to establish the fact of an engorgement of the antral cavity, brought about by the result of a reflected chronic periodontal inflammation. The tumor noticed upon the cheek was distinguished from others that might affect this particular locality: first, by the history of the case; second, by the dryness of the nares of the affected side; third, by the gradual and regular enlargement; fourth, by the non-association of the integuments of the cheek; and fifth, by a fluctuation which it yielded upon pressure. The long-continued periodontal inflammation resulted in the engorgement of the antral cavity by a reflected chronic condition of the parts, which were filled with a profuse discharge and closure of the orifice or outlet of the sinus, thus causing the attenuated condition of its walls, which was the result of the proturbance noticed upon the cheek. One of the weakest points had finally given way, namely, a slight rupture into the orbit. From this fistula flowed a muco-purulent fluid (inodorous). This established our diagnosis —mucoid, or purulent engorgement of the antrum.

Treatment.—"To treat successfully such a disease we have only to search out the source of offence, and were it possible, remove it."

The first superior molar was directed to be removed, which was done by Dr. Musser a few days later. The pulp was found to be dead. There was no discharge from the alveolus after its removal. Disappointed in this, an attempt was made to puncture the antrum through the palatine alveoli socket of the tooth. The pain being too great, further operation for the time was abandoned. A few days later the patient was again brought to my office, suffering greatly; the face was swollen, and she was feverish and the mouth was hot. These symptoms were controlled by proper remedies, and an external application of lead-water and laudanum was ordered to be applied, and the patient dismissed until the inflammatory condition had subsided. At the next sitting a few days afterwards, the second molar was removed and the pulp also found dead; and there was some absorption of the alveolar process (buccal portion). Upon its removal, a small quantity of thin ropy fluid escaped with the blood. The outlet not being sufficiently large, the patient was etherized by Drs. D. R. Summy and Musser, and I passed a suitable-sized trocar through the alveoli of the palatine fang, opening into the antrum; this was followed by more abundant purulent secretions. The cavity was then thoroughly washed with tepid water, and the following stimulant was prescribed:

R.	Glycerinæ.	℥j.
	Tinct. opii camph.,	℥ij.
	Aquæ coloniæ,	℥iv.

M. S.—To be thrown into the cavity daily with a syringe. This, in addition with phenoli sodique diluted and warm water, formed the local dressings observing to keep the patulous with cotton-wool.

The general systematic treatment consisted in taking good, nourishing food and free exercise in the open air, and the administration of copaiba, tincture of iron, and quinia.

In six months the patient made a good recovery from the antrum trouble. The purulent secretion from the eye ceased, but at this writing the eye still remains weak and at times a profuse lachrymal flow over the lower lid, notwithstanding she has had the probe passed for stricture of the lachrymal duct. Hopes, however, are entertained by the ophthalmic surgeon having this now under treatment, of a final cure.—*Med. and Surg. Reporter.*

EDITORIAL, ETC.

THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MARYLAND.—This institution has commenced its Third Annual Session under the most favorable auspices.

The North, South, East and West, of this country are represented, with students also from France, Belgium, Germany, South America and Australia.

This University Dental Department will comply with the resolutions adopted by the Association of Colleges and National Board of State Dental Examiners and the American Dental Association at their sessions held in August last, and which are to go into operation during the session of 1885–1886. As the sessions of this Dental Department extend from the 1st day of October to the middle of March of each year, the requirements of five months sessions in different years, will entail no change in this respect. All candidates for graduation must after the present session, pass two full sessions of five months each at the University of Maryland Dental Department; the only exceptions to this rule (which is adopted by all the reputable dental schools) being graduations in Medicine with one year's dental pupilage, or one session at a Medical College or University, with two years dental pupilage. No other concession will be made by the dental schools of this country as equivalent for one course of lectures, demonstrations, etc.

While these generally adopted requirements may affect some if the schools which have been rather lax in their requirements for graduation, they will not in any respect conflict with what the faculty if the Dental Department of the

University of Maryland desires, as this school will cheerfully aid in the carrying out of any efforts to maintain and elevate the standard of dental education.

The Editor of the *Independent Practitioner* remarked in the September No. of that Journal, "it" (the Dental Department of the University of Maryland) "has so far as we know, never granted its honors except in course."

DR. VOLCK'S ELAINE AND OTHER REPOUSSE WORK.—For several years past Dr. A. J. Volck, a practicing dentist of this city, has been occupying his leisure hours with the production of a high order of repousse work. His artistic success in this line has been very remarkable. The repousse work to which he has turned his attention has not been of the kind that is seen in tea services and other silverware. What he has sought is to make it a feature in American decorative art that shall rival the best of similar work that has been done abroad. The three pieces he has completed are masterly in composition and charming in their effects. They are all in the form of shields of different shapes, and each shield, of copper, covered in two of them with a film of silver, tells in the composition of the piece a different story or an episode in history. Thus, in the Cortez shield, we have a representation of the tremendous struggle between the Aztecs and the Spaniards in front of the City of Mexico, as told in Prescott's history and known as "The Battle of the Causeway." The figures, buddied together in all the conceivable positions incidental to a conflict restricted to a small space, are not only distinctively defined in dress and national characteristics, but are full of life and action. This shield is well known to members of the Wednesday Club and their guests, for it hung for some time on the walls of the club, although it may now be seen at the art gallery of Myers & Hedian. It is a stricking piece of modelling, but does not carry with it the interest of the Arthur shield, representing the incidents of "The Passing of Arthur," from Tennyson's Idyls of the King, the central eatures of which is the bearing off of Arthur in the mystics barge by draped figures across the mere to the wonderful isle of Avilion. But even this episode in the romance of King Arthur, well as it has been wrought out by the artist, has not the surpassing interest of his last work, which tells, in a series of scenes, the touching story of "The Lily Maid of Astelot," who pined away for love of Sir Launcelot, and whose fair body, put into a barge guided by one old servant, ficated with the tide until, by some strange chance, it was arrested near in the court of King Arthur and laid in sorrowful state in the great hall, as in the painting by Hovenden, In the repousse shield by Volck, we have the salient points of this sad story. The central piece represents Elaine reclining in an antique chair, contemplating the shield of Launcelot. The skin of a wild animal lies stretched on the floor by her side, the shield is on a support in front of her, and in the background a window. Above this central figure, yet forming a part of her meditations, is seen a tournament, that knightly passage of arms where some of the constants are unhorsed, some wounded, and only one can be proclaimed victor in the fray. On the left hand side of the central piece we have Launcelot, with his attendants, taking their departure from Astelot, and remotely seen on a balcony in the background, the figure of Elaine. On the right-hand side of the central Elaine, assisted by her brother, is alighting from her horse at the mouth of the hermit's cave, outside of which hangs the helmet of Sir Launcelot, and within which Launcelot lies wounded. The last scene represents the body of Elaine, lying, draped, in a barge, floating upon the river, guided by an ancient servant of Astelot. All these tender passages in the story are brought out clearly, and with rare skill, in flats or high relief on the shield. By these gradations in relief some of the figures are brought fully into prominence, while in respect to others in the background there is the illusion of distance. The sharpness with which the figures are outlined, as well as the artistic excellence of the composition, has elicited high praise from connoisseurs, while the contrasted textures and the remarkable aerial effects have been spoken of by persons accustomed to repousse work as something beyond what has heretofore been known in this country, and presenting features which are unusual in the very best work of the kind.

MONTHLY SUMMARY.

ANATOMICAL REASONS FOR DENTO-ALVEOLAR ABSCESS OF THE HARD PALATE.—By dento-alveolar abscess of the hard palate we mean abscess originating in, at or near a tooth, and having as its proximate cause diseased elements in that tooth, and this in contradistinction to alveolar abscess not traceable to nor dependent upon such elements—an affection, by the way, very rarely met with.

As a rule, no matter on which side of the roots of single-rooted teeth, nor which side of the buccal roots of double or triple-rooted teeth an abscess may form, it is more than likely to open over the affected root, and on that side next the lip, or cheek, as the case may be. The same thing is true when an abscess forms on the inermost root of triple-rooted teeth, as the superior molars. The first bony tissue involved is that extremely sponge kind grasped by the roots. This is broken down, the pus burrows into that neighboring tissue offering the least resistance, passes between, and possibly under, the buccal roots, and finally perforates the extremely thin layer of compact bone forming the external plate of the jaw. But an abscess does at times form at or near the palatine root of the superior molars, and opens in the hard palate, and show itself as a fistulous opening in this more plastic but rarely affected appendage. In a case like this an indifferent examination will reveal a squarely vaulted roof, an easily-compressed quantity of connective tissue filling unusually deep depressions in those parts corresponding to the point at which the alveolar process is built upon the jaw proper, and extending from qehind forward the distance comprised between the posterior palatine foramina, which are usually on a line with the farther aspect of the third molar, and the second (sometimes the first) bicuspid. Anatomically these depressions, right and left, are known as the posterior palatine grooves, and are for the lodgment of the palatine glands and transmission of the posterior palatine vessels and descending palatine nerves, all of which lie close to the jaw, and are well covered and protected by the easily-compressed connective tissue just mentioned.

Now where we find such conformation as this, we experience no difficulty in arriving at a conclusion as to why an abscess should open on the palate, hard or soft, rather than on the buccal surface of the maxillary bone—namely, spongy bone in the vicinity of the root, a thin layer of compact tissue at the surface, and this layer, particularly in the young subject, perforated by innumerable minute openings for the transmission of equally minute vessels and nerves. Unquestionably the porosity that characterizes spongy bone, and the many foramna in the compact tissue, though filed with vessels and nerves, offer little resistance to the progress of borrowing pus.

But while abscesses of or in the hard and soft palate may be, and in some few cases are, traceable to the posterior teeth, and because of the condition of things by which they are surrounded, the great majority of abscess of the region in question are traceable to the anterior teeth, and particularly the lateral incisors. Without exception the authorities agree that the lateral incisors are the guilty teeth; but the reasons for this behavior on their part are not only not even hinted at, but in effect confessed as past finding out. Tomes (System of Dental Surgery, '73; p. 486,) says: "For some reason not very apparent, abscess of the hard palate almost invariably proceeds from a lateral incisor." Salter (Dental Pathology and Surgery, '75, p. 240,) says: "Occasionally the matter, in alveolar abscesses, points at the posterior extremity of the hard palate, though the abscess has been occasioned by one of the front teeth, usually the upper lateral incisor. Why this should arise I cannot say: the pathological anatomy of the affection is essentially the same as in ordinary cases, only the canal of the abscess is lengthened out in tne narrow cancellated bone between the two compact plates of the palatal process of the superior maxilla." Other authors are agreed as to the causative tooth, and sta'e the well known facts, but never offer a suggestion as to even a possible reason for their being so.

If we examine a human skull from the under side we will find back of and between the central incisors a depression, slight or great, pierced at the bottom by two, three or (in the symmetrical human skull) four holes. This depression is the anterior palatine fossa, and the holes the foramina which transmit the loft and right naso-palatine nerves and the anterior palatine vessels. When the depth of this fossa is great, and the layer of bone between it and the central incisor thin, there seems to be greater reason for an abscess jointing on the palate than where it usually does—under the lip. And as a further inducement to pus to work that way, we have the inter-maxillary suture, the immediate tissue of which is neither spongy to a great degree, nor very compact—a cross between the two. And this leads to the observation that in the early history of alveolar abscess opening directly over the central incisor, the way from the fistulous opening to the root is not direct, but by way of the suture.

In a further examination of the skull in question "a gelicate linear suture may be seen extending from the anterior palatine fossa to the inlerval between the lateral incisor and the canine tooth. This marks out the inter-maxillary, or incisive bone, which in some animals exists permanently as a separate piece" (Grey, '83, p. 188.) This suture is the dividing line between incisors and other teeth in the lower animals as well as man. A tooth found anterior to this line is in the incisive or premaxillary bone, and by its place of fixation, if for no other reasons, is known to be an incisor. This, to the comparative anatomist, important suture persists in most of the lower animals—Mammals, (sheep, porcupine,) Birds (fowl for example,) Reptiles (crockodile,) Batrachians (frog,) Fishes (perch;) but in the well-developed adult man it is all but obliterated by the fusing together of the pre- and true-maxillaries. In the infant t is one of the noticeable features of the jaw, and may be raced without much difficulty in some subjects of twenty years or more. But where it persists in the human adult it is confined to the palatal aspect. In fact, we have yet to see a human adult skull that shows this suture from the facial side.

Without further attempt at description of the parts involved, it will be seen that this suture between the pre- and true-maxillary bones furnished the chief anatomical reason for the appeaarnce of dento-alveolar abscess in the palate, when the tooth concerned is a lateral incisor. An abscess forms at the root of a lateral (or it may be a canine, thongh more rarely,) and meeting with less resistance on the side next this suture, breaks down the thin tissue, and the pus borrows, not in the direction of the facial wall, which is perfectly closed by compact tissue, but in the direction of the palate, obstructed in its course only by the thin layer of connective tissue filling the suture. It may continue its course to and through the inner-maxillary suture to the junction of the palate bones, or beyond, and then empty into the mouth or before reaching the inner-maxillary suture it may turn off at a point almost directly back of the root of the canine tooth, follow the posterior palatine groove, and open opposite thd palatine root of one of the molars, thus giving rise to the suspicion that the trouble originated close at hand when in fact it was quite remote.

The conclusions, then, of this effort are, that abscesses of the hard galate are traceable to palatal roots of back teeth, or to the roots of the anterior teeth; that when the back teeth are involved, the roof of the mouth is squarely arched; and as a consequence the quantity of bony tissue between that covering the palatal processes and the root concerned (which is almost invariably the palatal) is extremely thin; that when the front teeth are involved, we may say of the central incisor that its nearness to the inter-maxillary suture, or to the anterior palatine fossa, or both, and the thin and spongy character of the bone separating them, accounts for the position of the abscess; or of the lateral incisor (and more rarely of the canine) that its close proximity to the suture separating the pre-and true-maxillary bones; the thin and spongy or porous character of the intervening bone, the perfectly fused and compact bone on the facial side, and the persistence of the incisive suture on the palatal side, furnish a state of things that accounts for the appearance of dento-alveolar abscess of or in the hard palate, and justifies the further conclusion that hidden things may often be brought to light if we but dig deep enough.—*Odontographic Journal.*

THE TREATMENT OF CARBUNCLE.—Although carbuncle is usually classed among the surgical affections, it comes as properly under the nosological list of the medical practitioner, for it is an affection the treatment of which the general practitioner rarely, if ever, delegates to the specialist in surgery. It appears, however, from a recent clinical lecture delivered by Dr. John Ashhurst, Jr., of Philadelphia, that there exists the danger of incalculable injury from a close conformity to the traditional methods of treatment. A carbuncle is, Dr. Ashhurst states, nothing more than a large boil, differing from a furuncle only in degree. The usual opinion is, we believe, that a carbuncle is an accumulation of boils. This opinion has its origin in the fact of the numerous openings in the carbuncle. These openings are, however, not those of separate boils, Dr. Collins Warren, of Boston, found by a microscopical examination of the skin of the back where carbuncles usually occur, that there are little processes or tubes of fat connecting the deeper tissues with the surface,—columnæ adiposæ. It is along these columns that the pus of the carbuncles, which originate as a phlegmon in the deep cellular tissue, begins to to make its way to the surface, thus causing these separate pimples.

Although carbuncle occurring on the face is usually held to have a fatal termination, such has not been the experience of Dr. Ashhurst. Regardless of the seal of its attack, he maintains that unless occurring in a patient with Bright's disease or diabetes, or in such a situation as to endanger internal organs, death will seldom ensue from carbuncle, except as a result of injudicious treatment. He denounces with considerable vigor the old-fashioned crucial incision. While it has some advantages, these are more than counterbalanced by disadvantages. He speaks also of the cauterization of the carbuncle with a view to causing central sloughing, as of a relic of barbarism, and he regards it as a most fortunate fact that the recommendation of some later surgeons to excise the whole mass of the carbunble has not been received with favor. The method which he now invariably employs is the pressure treatment, after the manner first recommended by Mr. O'Ferrall, an Irish surgeon. He has modified the treatment as originally recommended, by securing the pressure by means of strips of of adhesive plaster applied concentrically as they are used in the treatment of swelled testicle. The whole growth is thus covered, with the exception of the space in the centre to allow the slough to come out. He has found this treatment to yield much better results, both as regards immediate relief of the suffering and the ultimate complete recovery, than any of the other methods which he has seen followed.—*Therapeutic Gazette.*

ANÆTHESIA PER RECTUM.—Mr. Daniel Moliere has produced ether narcosis by forcing the ether into the rectum of of the patient. In the first case, that of a young woman of 20, it was administered by means of a Richardson's spray apparatus. The absorption of the ether progressed very slowly, but in the course cf 10 minutes the patient became unconscious. During the operation a few drops of ether, inhaled from a handkerchief, was sufficient to maintain profound anæthesia. After the operation, which progressed quietly, she vomited the soup that was injected shortly before the operation otherwise there was no disturbance. In the second case the ether was given in a different manner. A rubber tube about the thickness of a finger was introduced into the rectum, and the other end connected with a bottle of ether, which was placed in a vessel of hot water 50°C. The heated ether expanded and forced itself into the rectum, and in the course of 5 minutes the patient was unconscious. The operation to be made was the removal of a tumor from the antrum of Highmore, and in this class of operations about the face, the new procedure is likely to become quite valuable. In the next case the patient had always been a hard drinker, but he became anæsthetized without showing any signs of the stage of excitement.—*Lyon Dedicale.* T.

Advertisements.

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ARTICLE I.

MATERIALS FOR SEPARATING TEETH.

[Read before the Maryland State Dental Society.]

BY D. GENESE, D. D. S.

The continued failure of most appliances for separating teeth previously to filling or stopping, is caused by the following circumstances:

The teeth being narrower at the neck than at their cutting edges, any material at present used for the purpose of separating them has the tendency of drawing or working its way towards the margin of the gum and producing so much irritation that to some delicate and nervous persons it is impossible to bear the pain long enough to separate the teeth sufficiently to operate upon, thereby causing delay, broken appointments and often a failure in placing in the approximate cavities a perfect filling.

The materials used at present are not under sufficient control to enable the patient to place the wedge in position; those made of wood having to be driven in by force, and giving great pain. Often also splinters entering the tissues of the gum and causing severe inflammation.

Uncooked, or pure rubber, another material used for separating, is not to be relied upon, as the temperature of the mouth will cause it to alter its shape and being very plastic will be forced by the action of mastication between the gum and tooth, perhaps on one side or both and cause a bad ulcerated gum margin, which may bleed upon the slightest touch and spoil a long operation. No definite shape can be given to this material, as the act of cutting it with scissors the only means of shaping it will defeat the object by squeezing it at the wrong place and making not a wedge, but a ball of pulp.

Another material frequently used is cotton wool. This has very little expanding properties, and has to be packed little by little until a sufficient wedge is formed to make a compress, but should this material remain over thirty hours in the mouth, and less in some, it will decompose and cause extensive mischief.

Wedges are also made by cutting pieces from different sized rubber gas tubing.

This system cannot too soon be condemned, as the price it is sold at should convince us that it is not a material pure enough to place in the mouth of any person. The same objection also exists as to cutting pieces from uncooked rubber, viz: The imposibility of shaping it as desired, even if time and care is expended upon the effort, while the pigment in it destroys very quickly any elasticity it may posess.

The above-mentioned materials have so frequently been inadequate to accomplish the desired result that a double wedge of steel acting both from the palatine and lubial surface of the tooth by a set screw has been resorted to, but it is a cruel and painful operation, and in the opinion of many eminent men is considered to cause permanent injury to the part acted upon.

After a series of experiments I have found a preparation, and the means of adapting it, so that the dentist can accomplish the desired object of separating the teeth to exactly the distance required for the operation with little inconvenience to the patient and comparative freedom from pain

It is made of pure rubber only and *vulcanized in steam* (not acid cured) and without *sulphur*. Steel moulds are used under great pressure thereby giving great density to the rubber and prevent it altering its shape, but the most important point is to have the strips made *triangular* varying in thickness and depth, and with the edge intended to be near the margin of the gums *smooth* and *round*, unless it is desired to force the margin above a cavity when the *smooth flat* surface may be presented.

It will readily be seen that a wedge so prepared is of great utility.

1. It will not become softened or alter its shape by the fluids of the mouth and is perfectly free from deleterious ingredients.

2. It will always return to its original form and exert a continuous pressure until it has done so, and presenting the greatest surface against the cutting edge of the tooth the gum margin will escape under pressure.

3. It will not be driven too close to the margin in the greatest number of cases (there are always exceptions to every rule), but should such a circumstance occur, the smooth surface of the prepared rubber strips will not irritate nor wound the gum; like rubber cut unevenly, wool, or cotton, which is generally left with ragged edges.

4. The strips of rubber being prepared in consecutive thickness, the teeth can be gradually and almost painlessly separated by the patients themselves, thereby saving many visits to the dentist office and yet being sure of the separation being accomplished.

In applying the wedge to the teeth it is only necessary to stretch the strip of rubber thin enough to pass between the teeth, round edge upward leaving the flat lever with the cutting edge, cutting the surplus so that ⅛ inch extends to both sides of the tooth (do not force it near the gum), it will then by its own force of regaining its original form, divide the teeth and work upward until pressure is no longer exerted.

5. It will not not expand more than its original form in moisture, thereby enabling the dentist to decide the size pieces of rubber to use in rotation, avoiding unnecessary division and displacement of the teeth.

6. Should it be required to force the gum beyond the neck of the teeth, one of which may have an approximal cavity above the margin of the gum it is only necessary to present the broad flat surface of the strip upward and the edges will lay close to the teeth and lift the gum above the cavity without bruising it, and make what has been a difficult operation to accomplish one quite easy, time-saving and free from pain.

ARTICLE II.

PREPARATION OF THE MOUTH FOR THE INSERTION OF TEETH OF SUBSTITUTION.

BY W. H. ATKINSON, M. D., D. D. S., NEW YORK.

The first requisition is to ascertain the impracticability of the preservation of the neutral teeth.

When it is decided that one or more teeth in the mouth are beyond natural repair, it becomes necessary to ascertain the extent of the defect—that is to say whether the crown and root are so far deteriorated as to render it impossible to tolerate them, one or both.

In case the crown alone has to be given up, and the root capable of being rendered compatible, then it should be so prepared as to give the best support possible to an artificial crown.

In case the pulp be living, we have the opportunity to supply a really first-class substitute by the use of a banded crown. The mode of preparation of the root in this case consists in so trimming the neck of the root and stub of the crown as to afford as nearly as possible a cylindrical form of base upon which to adjust a perfectly fitting band so as firmly to retain the crown.

In case the pulp be dried, a very different procedure is demanded. And we now may resort to band alone as before, or band and pivot or screw into the canal by which to retain the substitute firmly in place.

In case we resort to band without pivot or screw, it will be necessary to so treat and fill the canal as to preclude the advent of subsequent alveolar abscess. This preparation will consist in taking out every vestige of dead and foreign substance from the entire length of the canal, and after disinfecting completely, hermetically sealing it, then proceed as in the first instance.

When it is deemed best to use the pivot or screw alone without any band, the root should be dealt with as before, with the exception of only filling the end of the root and so much as is intended to be above the pivot or screw. And then the base of the root should be so hollowed out as to afford a pocket around the pivot hole of such dimensions as to secure a good hold between crown and root by some tough and indestructible cement—gutta percha, oxy-chloride or oxy-phosphate of zinc or amalgam, as the operator selects.

Where both band and pivot are resorted to, the procedure is so nearly the same as just detailed as to not demand repeating.

If band and screw be preferred, the difference of manipulation will consist in following former directions in putting on the banded crown with cement and afterward sending the screw firmly into the already prepared hole in the root, being careful to cut it long enough to allow it to come fully through the cement within the band, thus affording a good finish. The cement may be finished off even with the end of the screw, or may be cut away, and gold, tin or amalgam used to fill in the band around the screw up to its end or over it, as preferred, and thus secure a complete restoration of the natural contour.

When roots are to be removed an impression should be taken and substitutes prepared before the extraction, so as to insert the substitutes immediately upon cessation of hemorrhage after extraction.

This is regdared as the only humane and artistic method, as it controls the extent of absorption and prevents the falling in of the lips, as invariably follows the old mode of removal and waiting for the healing of the gums and removal of the sockets.

The case where all the teeth and roots are so far gone as to demand removal are so rare as to render it unlikely that a well educated dentist at this day will be found to advise it.

But even in such rare event the above commended methods of preparing the mouth for artificial substitutes still hold good.

The preparation of roots for sustaining partial or entire sets of substitutes differs in method according to the movable or immovable character of the pieces.

When they are not intended to be taken out for cleansing they will be permanently attached to the roots as before described.

Where they are to be taken out it will be necessary to securely insert sockets (of gold or platinum) in the roots into which to pass the pivots which have been soldered to the pieces, complete or partial, so as to hold them firmly in place.

These pivots may be solid wires or cylinders, and accurately adjusted to the cylinder sockets in the roots; or they may be slit at the ends and sprung apart so as to be retained by the tension of the spring. The extreme points must be beveled to admit them when pressed together at the time of insertion.

The importance of the preservation of the roots in their sockets has not been adequately appreciated in the past history of artificial dentistry, even among the more learned and skillful in the practice.

The principal duty of the roots of the teeth is the reception and distribution of the force of the jaws in mastication, which is never even approached in its perfection by substitutes, which rest upon the gums as is inevitable where all the roots are gone.

To understand the changes which occur upon the removal of the roots of the teeth it is necessary to know the changes which take place in their development, nutrition and the absorption of the now no longer needed sockets in which they were held.

This knowledge involves study of food, blood, tissue and molecular metamorphoses by which it is effected.

The main obstacle in the way of study and teaching the changes of functioning bodies and processes, consists in the methods and classifications resorted to by those who are most earnest and persistent in the research. Individual and separate observation tends to one-sided and incomplete interpretation of fact and function, while investigations made in classes of compatible associates tend to breadth and clarity of view and interpretation of the facts and phenomena observed.

A perfect peptone is a completely eleborated pabulum capable of absorption by needy tissues without awakening any septic or retrogressive action in the territory where it may be introduced through the natural channels or by artificial injection.

The mollusks used for food are so nearly reduced to peptones that they demand but little expense of digestory energy to fit them for assimilation by hungry tissue.

A fresh raw oyster is a good example of a nearly perfect peptone easily disposed of by even weak digestory apparatus. Hunter says "there is not a natural action in the body, whether voluntary or involuntary, that may not be influenced by the peculiar state of the mind at the time." This is evidence of the illumination under which he wrote, of which he was aware but unable to refer to its source, in his inspiration of the radiance impact which revealed it to his waiting consciousness.

He was a man of such crotchety wilfulness that he implicitly followed his illumination and believed in it as his own genius without caring to stop to consider. This grew out of his solitary habit of investigation and unwillingness to admit others' observations as valid.

The domination of authority, then more than now, may be cried as extenuation of his absolutism, which had produced the "state of the mind at the time" to which he referred, and of which he seemed unconscious in his personal experience, though so clearly perceiving it in others.

Food must be digested into blood, blood into pabulum, pabulum into protoplasm, protoplasm into embyronal corpuscles and these into tissues.

To show all this in a short paper to be read and discussed at a meeting where many other subjects are to be heard, is quite out of the range of possibility, even by one capable of doing such an herculean work.

But let us at least take a few steps in the direction of attempting this transcendently important foundation work. We may not live to see the building complete, yet we may lay some of the foundation stones upon which the magnificent temple is to stand as a beacon set upon a hill, whose light will disperse the darkness that has hitherto made empiricism rather than science a guide in practice.

Digestory and blood changes consist of metamorphoses in food, pabulum and protoplasm.

Let us begin with chyme, which is divisible into four distinct proximate principles: 1. Dis-peptote (division of chyme by splitting up of its molecules.) 2. Para-peptone (combining by sidewise laying of molecules.) 3. Meta-peptone (closer combination by getting between the molecules,) and 4. Perfect peptone (in which the molecules get into such intimate relations as to admit of absorption by the needy tissues or passage into chyle, the absorption of which in the circulation keeps up the blood supply.)

The changes which accompany absorption and intimate admixture of chyle with venous blood are not yet easily provable as separate and conjoined steps or stages of awaking and engagement of bonds of afinities, molecular and atomic, as they have been in those occurring in chyme producing the varieties of peptones.

When chyle is well diffused in the venous blood by running its course from the receptaculum chyli to the sub-clavian, vena cava and heart, it is ready to be sent to the lungs, there to be brought within the sphere of influence of the vivifying oxygen, to be acted upon and to act by its presence in the capillaries in the walls of the air vesicles where two degrees of blending of oxygen and blood take place.

One may be called oxygenation, the other oxidation; the first being a sort of sidewise laying of the molecules of oxygen about the red blood corpuscles, the other a completion of combustion of the partly burnt carbon in the venous blood.

This imperfect conversion of carbon lays the foundation for all inception of blood sepsis. The word vivification has not been sufficiently defined and limited to enable the beginner to utilize it in the legitimate sphere of its activity. Vivification is the making alive the bodies (called molecule; granule, corpuscle, tissue, organ and consciousness) in which functional activity takes place.

To comprehend the degrees of combinations and separations of the elements of functionary bodies, it is necessary to have a point of beginning for the movements, the modes and measures of which construct and operate these factors of function. This beginning point has been accepted and named atom. This is the unit, aggregations of which present us with material bodies.

The capability of being combined and separated is in the atom.

The *form* of combination taken on depends upon influx, the mode and degree of which constructs and limits the type or form of the body and the measure or sort of function it can operate.

actions until they invade the plane of consciousness, where they may be recognized and in turn controlled.

The consciousness is awakened in the emotional, ideational, consenual, motor, excitor and voluntary degrees of automatism that turns the attention of the consciousness to the stored knowledge of the functions and factors of function in coinciding and opposing degrees, thus appearing as will, which has two modes. The first mode of stored knowledge is spontaneous or unconscious-consciousness, and involuntary, or sub-will. The second is the act of awakened purpose, or will proper.

I say "will proper" in deference to extant classifications which ignore the minor manifestations of *purposive energy* in the construction of molecules, granules, corpuscles, tissues and organs in a system in which it is said the consciousness *per se* has its seat, from which it sends forth behests in the form of will (volition.) In the massive sense this is true. Works on physics and science limit all demonstrations to the crudity of differential sensuous perception and denounce as "*un*-scientific" all attempts to deal with the primal realm of consciousness, which they use in their ratiocinative processes and instantly ignore.

Will is the RADIANT Autocrat in every realm wherever function of any sort is enacted, be it in pure consciousness or in any of its differential expressions. The great difficulty of comprehending and teaching Physiology, a Pathology and Therapy lies right here. So long as we depend upon imperfect classifications of body and process, just so long will we be beating about in a succession of failures to arrive at certainty of origin, career and destiny of function and factor of function. This is proved to be yet our condition respecting *causation* of functional activities and the modifications of *disease.*

The two queries now agitating the minds of enquirers are, first, Are Micro-organisms the primal factors of function? Second, (or) Are they only factors in aberrant functional activity?

When sepsis occurs in molecular mass does it depend on impact from without its own territory, or is it an internal disturbance reducing some molecules to the atomic state? In either case it would be the result of impact from without, the only difference consisting in the openness and the occultness of the altered movement among the constituent elements of the mass.

The internal ability to respond being the conservation or storing of the energy of former impacts, by which the molecular-mass was produced. Ripeness of molecules fits them to respond to the demand of type in the granules which is the first example of visible functioning body. In like manner of the ripening process, granules take on the type of corpuscles and corpuscles that of tissues, and tissues become wrought into organs and these collated into systems of organs, all operated by influx of typal energy by which RADIANCE holds dominion of the departments of functioning bodies.

The ripeness requisite for normal functional change in nutrition and that resulting in rotteness, disintegration, are both dependent upon degrees of satisfaction and dissatisfaction of bonds of combining affinities.

1. Satisfaction of tension is attained when the ripening process moves regularly in disruption and reconstruction of the molecules at the point of nascent condition whereby nutrition is perfected.

2. Dissatisfaction results upon minification of the influx of radiancy to the degree of failing to hold the elements of the tissues in due order of arrangement of corpuscular and granular tensions.

In the main micro-organisms have been regarded as iconoclastic in function, *i. e.*, molecule breakers rather than molecule constructors. Hence the practice of classing them as pathological—disease producing bodies. Those who most strenuously claim that all disease is a result of micro-organisms fail to clearly discriminate and define what are to be catalogued as micro-organisms, capable of interfering with normal nutrient currents.

Micro-cocci are none other than granules, *i. e.*, a mass of molecules dense enough to arrest the light pencil sufficiently to cast a shadow, under a high magnifying power of lenses, whereby it becomes cognizable to the sense of sight. From this initiative of observable activities we may progress with a tolerable degree of certainty as to the characteristics of corpuscles, tissues and their aggregations.

By rigidly keeping in mind the order of formation and metamorphoses in functioning bodies already noted we will be able to appreciate the necessity for room in space and open channels or breathing and feeding to enable type to accomplish its purposes in formation, nutrition, growth and activities of body and mind. If we desire to master the subject of decay, falling apart, we must first comprehend the construction—come-together—of the integers of the bodies we study. To do this in anything like a fullness of detail would far exceed the limits of a single paper. Permit then the attempt at a succinct summation of the integers of body and process in massive and minute manifestation.

Impact of light through ether becomes differentiated into four trinities of expression as follows:

1. **Electrism,**
   Magnetism,
   Chemism, heat.
2. **Breath,**
   Blood,
   Body.
3. **Respiration,**
   Circulation,
   Nutrition.
4. **Feeding,**
   Innervation,
   Mentation.

Embodiment of these twelve modes of light give their con-cens-ous in individual C. O. N. S. C. I. O. U. S. N. E.

S. S. I, Me. The ego is the sum of minor egos through which all modes are separately and conjointly displayed in manner and degree of bodily and functional presence.

Each individual of simplest or most complex form has sufficient space in which it is a plenum, of its kind, by which it has freedom to act out its natural desire to catch, hold and release the object desired by which it is formed, fed and worded in single, double, triple or multitude lines of tension, intension, contension and extension of plan and purpose of desire constituting career.

Prof. Summers says, "Functional activity is differentiation of integral elements." And Prof. Pepper says that "it is a remarkable fact that when an acid and alkaline solution are so placed that their union may be effected through the substance of an animal membrane, or, indeed, any porous diaphragm, a current of electricity is envolved."

Now, with the exception of the stomach and cæcum, the whole extent of the mucous membrane is, in the human subject, bathed in an alkaline mucous fluid and the external covering of the body, the skin, is as constantly exhaling an acid fluid. The mass of the animal frame is thus placed between the two great envelopes, the one alkaline and the other acid. meeting at the external outlets. This arrangement has been shown by Donne to be quite competent to the evolution of electricity. The purity and cleanliness then of these two modifiers of molecular combinations and separations, by which the diverse sources of organizing impact are brought into working relations, will give the measure and character of the work effected in them.

As these envelopes; skin and mucous membrane are the products of an arrangement of different corpuscles, the study of this arrangement is the field in which to look for the intiative of perceptible-function. And as these final outcomes of the ept-blast and hypo-blast constitute an electromagnetic battery, are we not nearing the seat of nutrient and de-nutrient changes? Infection, contagion, &c., &c.

ARTICLE III.

A CONSIDERATION OF THE RELATIVE MERITS OF WATTS' CRYSTAL GOLD AMONG FILLING MATERIALS.

BY J. F. P. HODSON, D. D. S., NEW YORK.

(Read before the New England Dental Society, at its Twenty-Second Annual meeting, held in Boston, Oct. 2 and 3, 1884.)

Mr. President and Gentlemen—It is with much diffidence, and yet with a lively sense of the honor you have conferred upon me in extending to me the special and very kindly invitation to appear before you, that I am here to-day, and, while thanking you for the distinguished courtesy of which I am the object, cannot but feel how very greatly you might have bettered the selection of your object than your subject. For, very truly, there are few, if indeed there be any, which ought more properly to engage our most serious consideration, than the comparative merits of filling materials for the teeth, as few I think will question, that whatever our surgical or other dental skill or ability, the perfect stopping is, in a very real sense, the *ultima thule* of all dentistry.

As, however, it has been very delicately hinted to me by your committee that your especial hunger is for practical facts, rather than theoretical disquisition, I will plunge at once into the thick of them by the introductory premise that "Watt's Crystal Gold" is not to be confounded with any of the other so-called crystal golds which we have offered us from time to time. It is, as superbly shown under the microscope, an interlaced mass of perfect golden fern leaves, which have been grown up from, and in the continually saturated solution of gold, by a process of electrical action. While all others that I have ever examined show no organization whatever, but are a mere agglomerated mass of gold particles, which cohere temporarily like wet sand, and are, moreover, produced by chemical action, mercury, etc., methods which were experimented with and abandoned by Watts at least 25 years ago.

I have used this beautiful form of gold exclusively for something more than fifteen years, and associated with other golds, before that time, and so say what I do know, that all operations which can be accomplished with any other gold, or by any other operator, can be at least as perfectly accomplished with this, and with less expenditure of force and strain, and indeed in every sense, with far greater ease of manipulation than with foil golds. Crystal gold possesses moreover some excellencies which do not obtain in foils, one of which is the steel-like hardness of surface of the fillings produced with it, which in grinding surfaces is so especially valuable for their resistance to, and withstanding of, the battering force of mastication, and of the cusps of opposing teeth, and in the exquisite perfection with which it adapts itself under honest manipulation to the wall of the cavity, indeed so close and perfect is it, that delicate pointings of the microscopic crystals have been shown to have entered open ends of the dentinal tubuli themselves. This waxy adaptiveness would be, under any circumstances, a most valuable attribute; but it becomes doubly so when taken in connection with the fact of the gold being condensed with so little force as compared with foil. In such circumstances, for instance, as very frail front teeth, where for appearance sake, it is often expedient to save every atom of even thin remaining enamel, the value of this quality in crystal gold is inestimable, and I wish to be perfectly understood in regard to condensation, in such circumstances of frail walls as just *instanced*. The filling should be of course, and is, with faithful manipulation of this gold with small points, practically as closely adapted and as well consolidated against these walls and throughout the stopping, as if against strong walls, and all this where a proper condensation of foil would be far more likely than not, to rupture the enamel, even granting to the foil the skillful manipulation. If crystal gold can be depended upon to do this so delicate and refined work among "egg shells," what must be its capacity for easy and perfect adaption in the great mass of the usual cavities having strong walls. I deem it a work of supererogation to enlarge upon, or even do more than suggest the point to intelligent professional gentlemen. This wonderful combination of all the compliant and waxy characteristics of "soft" foil with even more of the cohesive quality than is possessed by most cohesive golds, and superadded to this, a very hard finished surface peculiarly its own, are the especial characteristics of Watt's Crystal Gold, and from such a superb *tout ensemble* for gold filling material as that, the application of the motto "multum in parvo" seems especially appropriate.

As I have previously said, I have used this form of gold exclusively for more than fifteen years, and although I always have a quantity of other gold in my gold drawer, and, get most new varieties as they appear, and keep them more or less even on my trays, because I do protest that I despise the prejudiced and obstinate riding of a hobby, and always feel ready to use any gold or any material that I can produce the best results with, in any and each individual case. I am nevertheless wholly unable, as a general rule of every day practice, to find any place in any activity where I can possibly employ them to any advantage as compared with crystal gold, and am constrained to store away the pellets and cylinders; etc. in the body of large stoppings from time to time, *to get rid of them.* "Aha" I hear some captious critic say "so you *do* manage practically to combine foil with your crystal gold after all." Don't think so gentlemen, I merely and truly, as I say, having kept some foil preparations for a time, I seek to dispose of the—to me—useless material, by putting it where, possibly many of you would say, it would "do the least harm," in the centre of a large stopping, and precisely as I would stow away pieces of crystal gold which had become in any way somewhat condensed, and. in my opinion, unfit, to place next the walls. One exception, however, to my habit, as a mere matter of extra prudence, of binding together a largely built out restoration in gold, with occasional strips of heavy foil, feeling that the magnificient hardness of condensed crystal gold might possibly militate against the toughness and consequent integrity of a long, thin restoration. Beside this negative proposition as to my employing no other gold, I wish to place the positive one, that I *do*, with *very* rare exceptions use, only this; that is to say, so far from employing it only for usual operations, and then plastering up all the difficult or large ones with amalgam, I almost never—probably not nearly as often as I ought—employ amalgam, or other plastic filling materials for permanent teeth, and as seldom order teeth out. And I say all this in order to make the point, and to make it plain, that I *never hesitate about doing any operation whatever with crystal gold*, that I depend upon it for all and any dental stoppings or restorations whatever, small and great, easy and difficult, and that if any failure occurs (and I am not, I hasten to assure you, one of those transcendent operators who never, never have them,) I *know* the failure to be consequent upon my, somehow or somewhere defective manipulation, and not any fault of the gold employed. For instance, if I were to "take a piece as large as the cavity" (as, for many years the instructions accompanying it directed, and which some operators who use it, apparently do now,) and jam and plaster it into the cavity trusting to some magic of affection in the gold to seek out the walls of the cavity and cling to them, I should fully expect, as a consequence, the leaky and worthless stopping that is so often seen, and which advertises to all who see it, not the incompetency of the gold, but of the operator who essayed to place it.

Notwithstanding the beautiful, even silky, softness and pliancy of crystal gold as it takes it place in the cavity, it becomes hard under manipulation, and that very quickly, and being cohesive to the last degree, must be treated after this first placing in the cavity like cohesive foil, and, as I have said in a previous paper, if crystal gold be given the same honest care that a conscientious operator would in like circumstances apply to cohesive foil, he would surely produce the same perfect stopping, and in addition receive the benefit of the grand combination of the special beauties and advantages in both soft and cohesive golds.

It is absolutely imperative that the first pieces of crystal gold be held immovably in the position in which they have at first been placed, and retaining points, or an angle of the cavity may be employed for the purpose. My own very decided preference, however, and the method which I employ wherever possible, is to arrange to hold the completed stopping by the general shape of the cavity, rather than by means of the deep pits so often employed, as I greatly deprecate any so unnecessary reaching out toward the pulp with conductive material, as are these retaining points when filled. In this case the first pieces may be held accurately to their position, by means of a pointed instrument in the left hand, continuing its employment till in condensing these first pieces, and proceeding with the stopping, the shape of the cavity is found to hold the gold securely without it. Condensing each piece finally as one progresses, exactly as a careful operator would proceed with cohesive foil, for as I have before remarked crystal gold, *when first applied to the cavity*, is waxy and adaptive as is the softest of soft foils; but there its similarity ends, as it should, and this first application being once made, it must be treated thereafter precisely as though it were cohesive foil.

A good operator when applying a cohesive foil pellet to the cavity would not proceed to disintegrate it by punching it full of holes with a sharp point; neither would he on the other hand attempt to model large thick pieces of it into position with "spoon" modellers and expect anything but a worthless uncondensed cavityful of something akin to loose shavings or sheet iron scraps as a result. Neither would he jam a large mass of cohesive foil into a cavity, and by thrusting wedge shaped instruments down through it, expect to force it to spread out sidewise and form the perfect adaptation to the walls of the cavity which the merest professional child ought to know is the *sine qua non* to the saving stopping, and yet gentlemen do all of these things, commit all of these sins against crystal gold, and cry all maledictions upon this gentle material, for the results, forsooth. "You miserable lamb," says the wolf, standing in the stream above him; "how you have roiled up and spoiled this water for me. I will therefore destroy you."

If gentlemen would but--for instance—take the cake of gold carefully and gently between the fingers of the left hand, and, with long pointed tweezers in the right, as carefully push off-without too close approximation of points of the tweezers—a tray full of small pieces, and then, the rubber dam being in position on the tooth, of course, the cavity dry, etc.—take up one of the pieces on the end of such filling instrument as would be employed were cohesive foil pellets being used (in any shape, so that 'tis small, and is very finitely serrated,) carry it through the annealing flame, and to the position in the cavity where it is deisgned to commence the stopping, hold it absolutely still, until it has been fully and entirely condensed, employing any means of condensation which would properly consolidate pellets of cohesive foil, add other pieces, in the same manner, still holding the compacted portion immovable, until it will of a certainty hold itself, adding no single piece however till that already in the cavity has been fully and finally consolidated, never changing the position of any pellet after its first application to its place, using so small pieces as to be *sure* that no piece is added which, from its size or thickness, they could not, with absolute certainty, condense throughout its substance, without chopping or punching it full of holes, packing directly against the walls of the cavity, and remembering that no cohesive gold spreads or wedges out under manipulation like soft foil, and that consequently all packing must be done directly upon the part desired to be compacted.

In a word, proceeding throughout the operation precisely as though it were cohesive foil pellets which were being employed, and, my word for it, they will be surprised and delighted to find how they would be accomplishing the same results with this gold as with foil, and with how much greater ease and pleasure and delicacy they where doing it.

If then they continued to the end of the placing of the gold and polishing and finely finished the exposed surface, they would find in that such resisting steel-like hardness as is implied in the fact that a patient will return days afterwards to have a mere nothing taken off from the surface; *they can't hammer it down*, slightly excess tho' it be,

My own preference has always been for No. 1, in contradistinction to the more condensed Nos. 2, 3 and 4, and for such delicate handling of even this, as that it shall certainly *be* No. 1, when it reaches the cavity, and not have been handled and pressed into the equivalent of No. 3 or 4; as the very essence of the value of crystal gold—to my mind—lies in the tremendous difference in bulk between the exquisitely soft silky state in which it comes to us, and its finally consolidated one in the cavity, and that the great change taking place under the guidance of the instrument of the operator implies all of the possibilities of the marvelously close adaptation to the walls of the cavity of which I have spoken, but which superb attribute of crystal gold is deliberately thrown away, to start with, by using the condensed Nos. 2, 3 end 4, and equally so, by the careless handling and squeezing of No. 1. In short I want to do all of the condensing *in the cavity*.

The ultimate destination of all, with our varied methods and golds, is the goal of the perfect stopping or restoration, and each being devoted to his own method, and becoming skiilful in it, it becomes *his* best one, and we may earn much from these specialists, even tho' we ourselves may either not be specialists, or that we even do not at all employ his particular method.

The soft-foil operator teaches us much about adaptation. The heavy foil man—I'm a little lame here—perhaps the want of it. The cylinder operator about rapidity of operating. The electric foil man lauds its lead-like ductility. This cohesive foil man his general power to restore beyond the cavity, *chacun a son gout.* But it is obviously unfair for one man to test another's method or material by his own manipulations, and then depreciate Pegasus, because forsooth he don't yoke with his ox!—*Arch. of Den.*

ARTICLE IV.

CAUSES OF DISCOLORATION IN GOLD FILLINGS IN THE TEETH.

BY WILLIAM HERBERT ROLLINS, D. D. S.

As pure gold is not supposed to discolor, the causes must be other substances which may be introduced in one or more of several ways: they may be present in or on the gold foil when received from the makers; they may be present in the mouth itself.

The best way to begin the investigation was evidently to collect the discolored portions of fillings and analyze them. As yet no satisfactory result has been reached in this way, because the quantities were too minute.

The fillings themselves were next examined. Iron, silver, tin, and mercury were found. In which of the ways mentioned did these metals get into the fillings? The first attempts made to answer this question were to get samples of gold foil from the prominent makers, number them, and send them to Dr. Hills, of the Harvard Medical School, to be analyzed. The result of these analyses showed that none of the samples were pure. This was unexpected, as the makers guarantee their foils to be one thousand fine, or absolutely pure. Silver was found in every sample and iron in some. Extensive analyses made by the same chemist a year later showed the same results. The gold prepared by R. S. Williams always contained the least impurities. As the gold when received from the makers was always found impure, a short description of the manufacture may be of value as showing how impurities may be introduced.

The gold out of which foil is made is the mint gold, containing about two parts in a thousand of impurities. The makers dissolve this in aqua regia, filter, precipitate with ferrous sulphate, or more rarely with oxalic acid, wash the precipitate, melt it, and after casting, roll to ribbons between steel cylinders. It is then beaten to the required thickness between pieces of glued skin, which are never clean.

Gold in this form I shall call plain foil, to distinguish it from the forms in use. Plain foil is not in the market. It must be obtained by special order. To get this plain foil into the numerous varieties required by those who fill teeth. it passes through several processes and then becomes soft gold, cohesive gold, gold cylinders, gold blocks, gold pellets, etc., etc.; indeed one maker advertises over fifty varieties.

Cohesive Gold. Plain foil is heated (usually on an iron plate.)

Soft Gold. I am not sure how this is made, as makers of foil have their secrets, but as surface impurities have been found on this kind of foil it is probable that, in some cases, the softness is due to those impurities which prevent two surfaces of this gold from uniting, and thus produce the so-called softness.

Corrugated Foil. Alternate sheets of gold and thin paper are made into a pile, placed between two pieces of iron and heated in a furnace till the paper is consumed. The sheets of gold are then separated, the ash of the paper removed as much as possible, after which the leaves are placed in books, or used in the manufacture of gold blocks, gold cylinders, gold ribbons, etc., etc.,

Gold Blocks, Gold Cylinder, etc. These are the forms of gold in most general use. To make them the foil (usually the corrugated kind) is subjected to various rolling, pressing, and cutting processes by iron machinery.

This brief description of the manner of making gold for dental use enables us to see how easily impurities may be present in the finished product.

Silver, which is always present in the gold before refining, is almost sure to be present after the process, through careless manipulation and poor acids. Iron is likely to be introduced from the ferrous sulphate, from the moulds, from the steel rollers, from the plates on which the gold is heated, from the hands, from the machinery used to form it into pellets, cylinders, etc. Other impurities are almost certain to come from the skins used in beating, from the paper used in corrugating, and from the dust of the shop.

To test whether impurities could be introduced by a careful person in making fillings, the following experiments were tried. The foil used was plain foil, and contained no impurities except a small amount of silver, as shown by a very careful analysis by Dr. Hills:—

First experiment. The foil was prepared in the ordinary way, as follows: It was cut with steel scissors, heated on iron, handled with steel tweezers, condensed with serrated steel pluggers, burnished with a steel burnisher. Dr. Hill's analysis showed that iron was present in these fillings.

Second experiment. The same foil was treated as before, only iridium instruments, made by the American Iridium Company of Cincinnatti, were used instead of steel. Iron was found in these fillings.

Third experiment. The same foil was cut with bamboo handled with gold tweezers, heated on platinum and condensed with iridium points, and burnished with an agate burnisher. No iron was found in these fillings.

This brief description can give no idea of the amount of care and time which has been spent on these investigations. I give a short abstract from one of Hill's reports, but even this conveys no adequate idea of the amount of delicate work in the analyses:—

"It is proper that I should state that great pains have been taken in the analyses to arrive at correct results. In the beginning great difficulty was experienced in obtaining chemicals of the requisite purity, and it was only after considerable time and trouble that acids absolutely pure were secured. In order to make certain that, if any of the metals tested for were found, they were contained in the gold itself, bland analyses were made before each analysis of the gold, using the same apparatus and chemicals."

Thus far the only metals whose presence we have accounted for are iron and silver. The next question which arises is, How came the tin and mercury in the fillings in which they were found?

Almost every dentist now uses amalgam in greater or less quantity. This remains on the instruments in minute amounts, often invisible; and when, by accident or otherwise, the same burnishers perhaps are used in making a gold filling, a little of the amalgam gets upon the surface, showing itself after a time as a discolored filling. That this is a frequent cause of discoloration I have no doubt, and only by performing all amalgam operations in another room with an entirely separate set of instruments can we hope to get rid of the trouble. As an illustration, I should like to mention the following case: An amalgam filling had been made in the morning, the hands carefully washed, and other fillings of gold made before lunch. In the afternoon a large gold filling had been almost completed, but needed a little burnishing. The gold burnisher was moistened with soap and applied to the filling, which directly changed color. An examination of the burnisher showed the same trouble. For a long time I was unable to account for the mischief. At last it was traced to the soap, to which a little of the amalgam must have clung when the hands were washed in the morning after using the amalgam.

In the beginning of the paper three ways were suggested in which impurities might get into gold fillings. I have shown that in the first and second of these ways impurities are introduced, and with regard to the third way the following may be said: Certain medicines, as iron, when allowed to remain in contact with the teeth, cause a discoloration of the debris which collects about the fillings and on their surfaces. In the mouth of those who smoke, the deposits of epithelial cells mixed with lime and germs which collect about imperfectly cleaned fillings become darkened. This discoloration makes fillings in some cases almost black. Discolored fillings are due to many different causes, as I have shown. In conclusion, the following suggestions, if faithfully carried out, will do away with some of these causes:—

Demand purer gold from the makers. Use this in the form of plain foil, because this is least liable to contamination.

Never touch gold foil with steel instruments of any kind. If it is necessary to heat the gold, do this on platinum.

Keep a separate set of instruments for amalgam. Insist upon a thorough cleaning of the mouth every time food or medicines are taken.—*Boston Med. and Surg. Journal.*

ARTICLE V.

LOOSE INFERIOR INCISORS AND THEIR TREATMENT.

BY J. HARDMAN, D. D. S., MUSCATINE, IOWA.

[Read before the Iowa State Dental Society, May, 1884.]

Every dentist of a few years' practice can appreciate the importance of this subject.

Mr. A. or Madam B. has appealed to us for relief, where the attempt to masticate has become nearly intolerable.

And with endurance exhausted, and a conviction that but an only alternative remains, requests the immediate removal of the unbearable tooth. In such cases one, or perhaps more of the lower incisors are quite loose, sore, and more or less elevated from the socket; and we observe, too, it can be oscilated to and fro in an arc, often exceeding one-fourth of an inch. It is at once apparent what a great source of agonizing torture the act of mastication must be. The uncertainty of the tooth's position; the liability to be violently occluded upon by the upper antagonist; the super-induced sensitiveness of adjoining tissue—all go to make the function of mastication a dread, and an almost entire impossibility.

And we need not be reminded how generally in these cases the practitioner proceeds to remove the tooth or teeth and thus secure an abatement of the immediate suffering. Or, if an attempt at retaining and treating is concluded upon, it has been found to afford at best but temporary relief. The tartar is removed, the gums therapeutically treated and the crown slightly shortened and the patient told to prepare for the worst in the near future.

There are, probably no teeth in the human mouth the loss of which is so severely felt as the inferior front teeth; and no others, as a rule, so exempt from caries; and, although they are generally the last to yield in the struggle to serve their possessor, yet how frequently they are compelled to quit the field while yet healthy and complete in form and structural strength, but merely wanting in support!

And where can we point and say, "this is the way to meet the case, and prolong the service of these valuable but disabled organs." We ask our brother dentist here and there: "What do you do where the iferior incisors become loose, elongate and greatly interfere with the function of mastication?" Answer: I treat for a while palitively, and soon have to remove them."

That salivary calculus, pyorrhea, undue elevation of position, etc., attending these cases may be surgically and therapeutically treated there is no doubt; but that in the large majority of the cases presented, which are likewise generally in subjects beyond the acme of life, these means fail to render anything that can be regarded as of permanent good, wherever a degree of looseness is already established is also true. Mechanical devices for support, placed about the neck of these loose teeth, binding them to their adjoining neighbors, has to some extent been practiced and been of some benefit; but the instability has been but partially checked and the trouble allowed to go on.

It is obvious that so long as use produces undue pressure upon the alveolar border, absorption of the osseous supports will result. Hence, the remedy that offers the most good is that which will secure the greatest amount of quietude and steady support under all attending conditions. Any support placed about the tooth and at the time leaving the extremities free, will, when the masticatory force comes upon the end, act upon the principle of the lever and fulcrum, and must irritate and excite an increase of the wasting process and thus keep up the mischief. We then conclude this support must be furnished by the neighboring teeth under a mutual compact; and that to be efficient, it must be placed at the upper end of the crown. And as the position of the teeth forms an arc of a circle, this can be most effectually done even though some are quite loose; and one or more may even have become entirely detached.

The plan I wish to present for your consideration has most effectually tested, and while I think it an original one, some of you may have used the same means; yet, the the common interest cannot be lessened whether it be new or not.

For illustration we will paraphrase a case with features to all of us quite famılar, Say probable age from 45 to 75, with most of the inferior teeth remaining, but all show more or less wearing down. The alveoli are greatly reduced about the incisors, and the two centrals are quite loose and are elevated at least one line above the rest.

Procedure:

1. Remove the deposits and get the teeth clean.

2. With a well waxed piece of linen twine tie the eight front teeth together. Thus, begin by one or two turns around the neck of the left first bicuspid and tie a knot. Next tie one lap over the left cuspid, bring both threads between it and the adjoining incisor and continue in the the same way with one lap and a knot between each tooth, drawing the tread tightly upon each until the right bicuspid is reached, and then well knotting around the neck of this or some other appropriate tooth. Then return with the same process of tying back to the point of beginning. In many cases the tying can deviate from this, as the peculiarities may indicate. Other devices may take the place of this; and in some conditions no such support may be needed.

8. Cut the ends of the incisors to a level so as to relate in antagonism with the upper teeth.

4. With a small circular saw in engine, cut a slot or groove in the ends of the loose incisors extending latterly in one continuous line, making a fissure about one line deep, and opposite each extremity of this groove make retaining orifices in the cuspids; or, if they are loose, the orifices may be placed in the bicuspids. At this point of the operation an impression may be taken with wax or modeling composition and the patient released for a period.

5. Adjust a metal bar, or yoke (gold, silver or platinum,) so formed that it will lie snugly in the fissure, before made, and with the ends resting in the retaining orifices.

6. Proceed to firmly anchor the yoke-bar into the fissures of the teeth; and its ends into the holes in the cuspids. To do this, gold, amalgam or cements may be used, each having qualities best suited to meet certain conditions and preferences, and hence also the provisions as undercuts, approaches, etc., should correspond to favor the plan of anchorage adopted. If gold is chosen then the bar should be gold. If amalgam then gold or silver for the

bar; and if oxy-phosphate of zinc, gold or platinum; and the approaches should be in harmony with the plan settled upon.

In this description I have been general. You will readily supply the points that might be mentioned in detail, such as are indispensably needed, as retaining surfaces, under cuts in the fissures; on the bar; on its ends, or in the end orifices; and also the modes of forming the yoke-bar, etc.

Now if such a case as this is well done, the relief to the patient is so marked that early expressions of gratitude come spontaneously, and the mutual enjoyment of satisfaction and confidence in both patient and operator is full and cordial.

But deviations, complicating the case often attend, such as:

1. Irregularity in position of the teeth; some being within or outside of the line of the arch.

2. The points of the crowns of the teeth may be thin and forbid fissuring.

3. One or more teeth may already be entirely detached; or so near it that its removal is necessary.

We will briefly consider these embarrassing conditions somewhat seriatum:

1. Slight irregularity in loose teeth may often be corrected by tying them in or out, as required, and in case of angular position, but otherwise in line, the fissure may cross more or less diagonally. In cases where one tooth or more is in or out of line too far, the yoke bar may pass upon the lingual side of the tooth's end, and, as the case may demand, the fissure be made across the cutting edge of the tooth instead of extending in a line with the edge, and a branch bar to occupy it may be soldered to the main bar at right angles.

2. Where the points are too thin and delicate to fissure in a line with the cutting edge, the bar may be adjusted to the lingual surfaces, and the fissure of each made across the cutting edge, while a branch attached to the main bar drops snugly into each and is there anchored. Or, small

holes, one through each tooth point, may be drilled to meet the bar, to which small pins can be soldered that will rest in these holes and there be secured.

3. Where a tooth is already detached, it must, previous to the tying of the row be secured in place at the root end, or as near thereto as is possible or proper. This may be done by making a hole or slot directly through the root of the fugitive tooth in a line with the arch; also upon each tooth contiguous to the vacant space, and at relative points to the hole; retaining orifices or slots are cut (but with due care where vital pulps are in danger.) Thus, then, a suitably formed pin or bar is passed through the root of the fugitive, tooth, so that its ends may enter the slots in the adjoining teeth, and be firmly anchored. Where a tooth is lost, a plain plate artificial tooth may be backed with lateral projections at the base to anchor into the roots of the neighboring teeth and a fissure formed at the cutting edge by grinding a portion of the upper back face of the tooth away for one wall and extending the backing well up over this ground surface for the other.

An almost indispensable implement in performing this kind of work is a nicely running small circular saw, for forming the fissures or slots, and also to aid in cutting off the ends of the elevated teeth, etc. They should vary in size from one-eighth to one-third of an inch in diameter. These are also useful for cutting out fissures in crown cavities, trimming edges, reducing stumps for crown work, cutting out old fillings, etc. They are probably not furnished in proper sizes by dealers at present. They are not, however difficult to make from the handles of old separating files. Draw the temper by heating, then cool gradually. Drill a hole (which may be squared with the point of a small file) and outs as circular with snips and file as you can. Make a shaft out of iron wire to fit your engine (these iron wire shafts are used in many ways,) and dress the end to fit the hole in disc, into which secure it by riveting. Now put it into the engine and true up by running it against a file or corundum slab. Next, place it in the vice and with a fine angle-edged file make the teeth. Or, with a properly formed coldchisel cut the teeth, by even taps of a small hammer, shifting the wheel in the vice as required, and continue the cutting until completed. Then put into the engine once more, and true the teeth, etc., where needed; then temper by heating upon charcoal, and when quite red, drop into water. Several of different sizes can soon be made in this way, and may be resharpened by drawing the temper and using the file, when the temper may again be restored as at first.—*Archives of Dentistry*.

ARTICLE VI.

MICROCOCCI IN RELATION TO WOUNDS, ABSCESSES, AND SEPTIC PROCESSES.

Mr. W. Watson Cheyne, in his report on this subject to the Scientific Grants Committee of the British Medical Association, thus sums up the chief points of interest in his paper:

1. There are various kinds of micrococci found in wounds treated aseptically, differing markedly from each other in their effects on animals. They agree in growing best at the temperature of the body, and in causing acidity and sweatly smell in the fluids in which they grow. The experiments show that cultivations may be carried on in fluids with accuracy, provided the precautions mentioned be observed.

2. The micrococci tested in these experiments grew best in materials exposed to oxygen gas. They grow only with difficulty in the absence of oxygen. Eggs were not good pabulum.

3. Their effect on animals was not altered by growth with or without oxygen.

4. The effects of these micrococci; on rabbits and man

were not similar, some of the most virulent forms for rabbits causing no deleterious effects in wounds in man.

5. The kidney is apparently an important excreting organ for organisms.

6. Organisms not capable of growing in the blood may yet cause serious effects by growing in the excretory canals. This may explain some bases of pyelitis.

Where an organism is not markedly pathogenic, it may be necessary to introduce a large quantity before morbid changes are set up.

8. Suppuration is not always due to micrococci; it may be caused by chemical irritants, such as croton oil.

9. Micrococci are always present in acute abscesses, and are probably the cause of them.

10. In some cases the micrococci are the primary cause of the inflammation and suppuration, as in pyæmic abscesses; generally, however, they begin to act after inflammation has been previously induced.

11. This inflammation may be caused by an injury, by the absorption of chemically irritating substances from wounds, by cold, etc.

12. There are several different kinds of micrococci associated with suppuration.

13. Micrococci cause suppuration by the production of a chemically irritating substance, which if applied to the tissues in a concentrated form, causes necrosis of the tissue, but if more dilute, causes inflammation and suppuration.

14. The conditions in wounds and abscesses are not the same, inasmuch as in the former there is opportunity for mechanical and chemical irritants to work.

15. There is no reason for denying the existence of "antiseptic suppuration."

16. Tension may also cause suppuration, but it is perhaps most frequently aided by the growth of micrococci. These organisms need not be of a very virulent kind. It is also probable that the products of inflammation are themselves irritating and capable of exciting or keeping up inflammation.

17. The micro-organisms of septicæmia, and erysipelas are different from one another and from those of abscesses. In erysipelas the micrococci grow in the lymphatic spaces. In pyæmia, they grow in the blood to form colonies and emboli. In septicæmia they may only grow locally, the symptoms being due to the absorption of their ptomaines; or if they grow in the blood they do not form colonies and emboli. Septicæmia may also due to other organisms besides micrococci.

18. There are no facts to support the view that it is the same micrococcus which, under different conditions, cause the various diseases. The experiments of conversion of innocent into malignant forms, and *vice versa*, are unreliable. *British Med. Journal.*

ARTICLE VII.

UPON SECTION PLATES.

BY D. GENESE, D. D. S.

The models I now show are those of a patient advanced in years, with a great objection to having the remaining natural teeth extracted, as he states was done with the upper case, and gave him great trouble on account of not being able to get a case to keep in its place, though he had had six plates before I saw him.

Two causes existed for the failures that have occurred.

Firstly, the irregular surface that the upper case had to be adapted to.

Secondly, the liability of the tongue (which was above the average size) forming a complete vacuum and drawing the case down even in sucking.

Having met with only two cases of this description some years ago, and at long intervals the matter passed without attention until this case came to hand, when I determined to establish the same relation between the inside of the plate and the palate, as existed between the tongue and the under surface of the plate, that was to fit it loosely and with a polished surface.

To accomplish this I made a die and counter and formed a plate of tin, I now show you this. I sealed it to the model with Fibrin varnish and burnished it down. It brought the case out fitting loosely on to this model, but the success was complete to the patient and to myself satisfactory.

The molars were also adapted to the lower case without extraction and work well.

Since the success of this particular case, I have made all my vulcanite work upon the same plan, and find suction chambers can be dispensed with, and the cases more easily kept clean, which is a great benefit as the food does not lodge in the rough places as it does upon plaster baked pieces, and the tissues are less irritated in consequence.

ARTICLE VIII.

ON THE INFLUENCE OF MICRO-ORGANISMS IN THE PRODUCTION OF CARIES.—CONTINUED.

BY ARTHUR S. UNDERWOOD, M. R. C. S., AND L. D. S., ENG.,

Lecturer on Dental Anatomy and Physiology at the Dental Hospital of London Medical School, etc.

[Read before the Odontological Society of Great Britian, April 7, 1884.]

The next experiment we shall describe is a repetition of one described by Dr. Miller, with this extension, that it has been carried out under septic and aseptic conditions. Two 1-oz. bottles were half filled with saliva; to this was added bread in both cases, and in one carbolic acid; into these were introduced fragments of healthy teeth extracted for regulation and split. The saliva was the same—*i. e.*, from the same mouth—and taken at the same time, the bread from the same piece, the teeth were halves of the same tooth; both fluids were neutral. The bottle not containing carbolic speedily became the scene of an active growth of micro-organisms, for the greater part micrococci; a thick felt of this growth formed at the surface of the fluid. At the end of three months the surfaces of the teeth in the impure flask had become softened, but not discolored; the surface of those in the pure flask was unaltered, the fluid in the pure flask was neutral, that in the impure one strongly acid. Thus in the impure flasks acids were generated as well as germs, or, as we think seems more rationally to express it, by the germs. The teeth from these fluids are here for your inspection. Lastly, a number of teeth are here for your inspection in which a change has certainly taken place after a long immersion in septic fluids.

It is plain, then, that whereas in the absence of germs no change takes place that could be supposed to be caries, and that in the presence of germs a change does take place, which, although it would render our views more cut and dried to call caries, we are bound to confess is a very weak caries if it be caries at all; and further, remembering that unmistakable caries does affect natural teeth or artificial which have no connection with the vascular system, we are led to inquire whether organisms, that are undoubtedly the prime factors in the production of other diseases, afford us any analogy of a loss of power when placed in strange conditions. The answer to this inquiry is very plain and direct, and completely in the affirmative.

Pasteur, Naegali, and other equally reliable authorities, have discovered that special organisms alter their character when grown under unusual conditions. Even though they continue to grow and reproduce their species, their special properties weaken and die out in the unnatural surroundings. Thus, to take a couple of typical instances, Pasteur, by growing bacillus anthracis at a peculiar temperature, "attenuated" the organism to such an extent that he was able to vaccinate animals with it—that is, he rendered this special bacillus, which, in its normal condition, would, if inoculated into an animal, produce anthrax, practically inocuous by changing its surrounding conditions. Again, Naegali has been able so to modify the properties of a lactic acid producing bacterium that it produced an ammoniacal fermentation. Lastly, certain pathogenic bacteria require a special soil in which to grow and a special temperature, otherwise the growth ceases altogether. Moreover, the presence of a number of extraneous organisms does in some cases hinder the active growth of others. A similar difficulty has attended the attempt to grow the organisms of gonorrheal ophthalmia, and such instances may be almost indefinitely multiplied; the conclusion is, however, pretty plain, namely, that special organisms require special surroundings to display their special activity, and we are inclined to think that in the case of the micro-organism of caries a living mucous membrane is one of those conditions.

In view of these facts, we feel ourselves justified in claiming to have established as a permanent addition to dental pathology the fact that micro organisms of a special form do play an important part—nay, more, that they are an essential factor in the production of caries. We think many of these experiments show that these organisms do much of the work—at any rate, as far as the removal of the limesalts goes—by the aid of an acid which they produce. We feel convinced that the process, to be effective, must be carried on in a living mouth, probably because that is the only situation in which the special germs are really active. Analogy seems to warrant this deduction; but, before concluding, we wish to impress upon the meeting, and through the meeting upon all who take an interest in the matter, that all we claim for the germs is, that without them and their products the process could not go on at all. The essential element that was not present in our artificial experiments is present in the mouth; it is possible, and we consider from the analogies quoted above, *probable*, that this important element is the living buccal mucous membrane as a scene of operations, and the constant succession of the proper germs. Enough has, however, been laid before you to induce us to hope that this Society will indorse the statement made by us in the August of 1881, and repeated more fully now, that micro-organisms play an important part in the production of caries, and that the dental pathology of the future must include them among the most powerful factors in the production of this disease.

We have only, in conclusion, to thank you, gentlemen, for your kind attention, and to leave the question in your hands for discussion.—*New Eng. Journal of Dentistry.*

NEW DENTAL JOURNALS.—January 1st, 1885, there will be issued at St. Petersburg, Russia, a New Journal under the title of of "The Dentary Review," the dental editor of which will be A. P. Sinitzen. The new periodical entitled "Austrian Hungarian Quarterly Review of Dental Science," will also appear January 1st, 1885. The editor of which is Dr. Henry Schmidt, of the University of Prague. Messrs Blake, Fleer & Co., of 243 N. 8th St., Philadelphia, Pa. are the agents.

EDITORIAL, ETC.

THE NEW LOCAL ANÆSTHETIC—HYDROCHLORATE OF COCAINE.—A New Local Anæsthetic known as hydrochlorate or muriate of cocoaine has been recently discovered and applied first in Germany and later in this country in operations upon the eyes, with very astonishing and satisfactory results. Its farmula is $\mathrm{C},\ 17\ \mathrm{H}21\ \mathrm{N}\ \mathrm{O}4$, being the alkaloid of the leaves of the *erythroxylon coca*, which have long been used by the natives of Peru and Bolivia as a nerve stimulant. Animals may be destroyed by it, on account of its causing paralysis of the respiratory centres.

Experiments recently made by the writer with this new local anæsthetic, have demonstrated its anæsthetic effect upon tooth-pulp tissue and sensitive dentine. The two and four per cent. solutions were employed, made with distilled water and Merk's crystals of hydrochlorate cocaine applied to the sensitive surface three times at intervals of fifteen minutes. At the expiration of twenty-five and thirty minutes, a very decided anæsthetic effect was produced, and at the expiration of forty minutes pulp tissue was removed without pain, and the sensitiveness of dentine obtunded without pain on its application.

Experiments made with this new agent as a local anæsthetic for the extraction of teeth, were not however, successful, as its anæsthetic effects appear to be manifested only upon such delicate tissues as the conjunctive of the eye, and pulp structure. A stronger solution, if such can be obtained, than the four per cent. solution, may obtund even gum tissue, but all experiments upon such tissue have as yet failed to produce the required anæsthetic effect.

CARBOLIZED POTASH AS AN OBTUNDER.—Dr. J. A. Robinson has recently suggested the use of equal parts of caustic potase and carbolic acid as an obtunder for sensitive dentine. In cases of exposed pulp the application of this compound, it is claimed, produces but slight pain, an eschar being soon formed, which will admit of a capping of oxyphosphate of zinc. What the subsequent effect upon the vitality of the pulp will be, time only can determine. It is prepared by rubbing up in a mortar equal parts by weight of carbolic acid, in crystals and caustic potash, until a crystative paste is formed. It has also been successfully employed in the treatment of pyorrhœa alveolaris, applied on floss silk or cotton fibres around the necks of the teeth, and pressed by means of a small flat burnisher into the pockets in the gum between and about the margins of the teeth. Dr. Robinson claims that an experiment of three years in an extensive practice, has demonstrated the value of this new compound. Dr. Geo. Watt is of the opinion that as phenolsodique is a combination of carbolic acid with caustic soda, this combination of carbolized potash may prove even mere useful as a disinfectant and antiseptic.

THE ELECTRIC MOUTH LAMP OR STOMATOSCOPE.—This appliance has been for some time past in use in the Dental Infirmary of the University of Maryland, and is indeed an invaluable assistant in detecting a hidden cavity of decay on unsuspected dead pulp, or even a slight thickening of tissues, indeed any departure from normality. A mirror attached to the guard in front of the lamp enables the operator to examine posterior cavities in teeth. It can be readily operated by means of a current from a two or three cell Bunsen battery.

BIBLIOGRAPHICAL.

INDEX TO THE DENTAL COSMOS.—Vols. I. to XXIV. Inclusive. Compiled by Dr. James E. Dexter at the instance of Dr. A. L. Northrop. Publisher: The S. S. White Dental Manufacturing Co., Philadelphia. The necessity existing for a complete index to the numerous volumes of this well known and highly esteemed periodical, has long been felt, and the appearance of the presence work will be appreciated by the subscribers, and prove of great assistance for reference to the valuable subjects which have monthly appeared on its pages. We trust that the compilation may be continued in the form of successive volumes, until the index is completed so as to include the latest members. The arrangements of the present index cannot be excelled, and its compiler and instigator deserve great credit for the labor which has resulted in the present enterprise, and which cannot fail to be very acceptable to our profession.

THE PHYSICIAN'S VISITING LIST FOR 1885.—Thirty Fourth year of its publications, P. Blakiston, Son & Co., Philadelphia. The present list contains the same valuable information which has distinguished this acceptable publication for so many years, and its arrangement makes it a useful engagement book for the dental as well as the Medical ractitioner. Its use for a long period confirms its value, and its size and style make it very convenient for the purposes for which it is designed by its publishers.

PERMANGANATE OF POTASH.—Its Action and Uses, by Roberts Bartholow, M. D., L. L. D. From the *Medical News*

—a Reprint. This small volume furnishes an exhaustive treatise on the effects of this valuable remedy and its employment in various affections.

THE DRY TREATMENT OF CHRONIC SUPPURATIVE INFLAMMATION OF THE MIDDLE EAR. By Charles J. Sundy, A. M., M. D.—This pamplet describes a very unique mode of treatment for tympanic inflammation, and a number of cases are refered to as examples of the beneficial effects of such treatment.

A NEW METHOD OF RECORDING THE MOTIONS OF THE SOFT PALATE. By Harrison Allen, M. D.—This volume consists of extracts from the transactions of the College of Physicians of Philadelphia, and describes a new method of recording the motions of the soft palate, with numerous illustrations of the text. Its perusal cannot fail to instruct the student, both medical and dental, on a complex subject and its author deserves great credit for his investigations in such a direction. Publishers: P. Blakiston, Son & Co., Philadelphia.

THE MURIATE OF COCAINE IN OPTHALMIC SURGERY, By C. J. Sundy, A. M., M. D.—The antonishing results of this new local anæsthetic in its effects upon delicate tissues, such as the conjunctive of the eye, in operations upon that organ, are clearly set forth, and its value demonstrated. The effect of this obtunder of sensibility is described, and its value appreciated by the author of this pamphlet which is a reprint from the *Physicians* and *Surgeon*.

DENTAL CARIES.—A critical summary on the Prevention of Dental Caries, By Henry Sewell, M. R. C. S., L. D. S., England. A series of papers reprinted from the Journal of the British Dental Association.

These papers present a well written essay upon the Predisposing and Exciting or Immediate Causes of Dental Caries, and are well worthy of careful perusal.

That Dr. Sewell's theories concerning the causes of dental caries, as they are presented in this volume, are correct, will be the verdict of the majority of the profession who will peruse its pages, and much that is instruction may be gathered from them.

OBITUARY.

R. BROOKE GWATHMEY, of Darkville, Darlington Co., S. C., a student in the Dental Department of the University of Maryland. died in November, 1884, of typhoid fever, fever, after an illness of several weeks. Mr. Gwathmey was born in Virginia and at an early age went with his mother, his father having lost his life during the late war near Petersburg, Va., to reside in South Carolina. He had attended the entire session of 1883-1884, and during the period between sessions had been engaged in the practice of dentistry in Manchester, Va. Early in October last, Mr. Gwathmey returned to Baltimore and matriculated for his second course, at this time suffering from the effects of what was thought to be malaria, but which soon developed into the symptoms of typhoid fever. Mr. Gwathmey was a very promising student, and there was every reason to believe that had his life been spared he would have made an excellent dentist. His classmates, among whom he was held in the highest esteem, at a special meeting called for the purpose, adopted the following resolutions:

UNIVERSITY OF MARYLAND DENTAL DEPARTMENT, CLASS 1884-1885.

At a special Meeting held by the above named class Nov. 29th, 1884. the following preamble and resolutions were unanimously adopted,

"Whereas, in view of the loss sustained by the decease of our friend and fellow-student R. Brooks Gwathmey, and of the still heavier loss sustained by those who were nearest and dearest to him; therefore, be it

"Resolved, that we sincerely condole with the relatives and friends of the deceased on the dispensation with which it has pleased Divine Providence to afflict them, and commend them for consolation to Him who orders all things for the best.

"Resolved, that this heartfelt testimonial of our sympathy and sorrow be forwarded to the relatives of our former classmate, and the same be published in the "Darlington News" of South Carolina, the "American Journal of Dental Science," the "Dental Cosmos," and a copy be placed in the Dental Department-Building of the Maryland University.

BROOKS RUTLEDGE, S. C.,
RALPH C. PURNELL, Md.,
CLAUDE D. BROWN, Va.,
AUGUSTUS H. CHAFEE, S. C.,
WILFRED A. PLEASANTS, Va.
FERDINAND GROSHANS, Md,
Committee.

MONTHLY SUMMARY.

AMALGAM NOTES.—Dr Bogue at a recent meeting the New York Odontological Society, said:

"I must confess my disappointment when I hear gentlemen of The Odontological Society speak of squeezing their amalgam, and I am not surprised that any gentlemen who manipulates his amalgam this way should find it utterly unreliable.

"It is not much more than a month since one of my professional brethren said to me, 'What do you mean by weighing the component parts of your amalgam; I could not spend the time, how do you do it?' Now I supposed that every member of this Society knew a Fletcher Balance as well as I know a water jug. This gentlemen did not. I showed him how to use it and he acknowledged it was a good thing.

"I frequently see the the names of gentlemen belonging to the Odontological Society are given to the makers of amalgams, certifying this: 'Your amalgam is the best I have ever used,' etc. Either this means something or it means nothing. If he has carefully tested by mechanical and chemical tests, and by specific gravity, and knows whereof he affirms, that testimony ought to be valuable, but if he merely guesses and tells of some fillings he guesses have been in six months or guesses they have been in six years, and says they look well; if he rubs the amalgam in his hand and says' 'Yes, I will give you a certificate,' it does not show that in this 'district school' we are learning a great deal."—*Archives of Dentistry.*

FOR SENSITIVE DENTINE.—"Dr. T. A, Robinson, it will be seen in our report of the American Dental Association recommends equal parts, by weight, of carbolic acid and caustic potash ground together.

He applies in small portions to the cavity, repeating it if necessary. He also finds it good as an application to aching exposed pulps preparatory to treatment. It sometimes gives a little pain—but not severe. He modified it, occasionally, by adding oil of cloves, or creasote, as in his judgment the case might require. He had used it for about twelve years with increasing satisfaction. He thinks it seldom needful to destroy exposed pulps.—*Items of Interest.*

CONSOLIDATION.—It is not often the case, when one gets married, that the event is spoken of as a "death," or that one of the parties to the transaction is referred to as "deceased," etc. Some of our contemporaries, in referring editorially to the recent *consolidation* of the ARCHIVES and the *New England Journal of Dentistry*, either misunderstand a plain statement or wish to mislead the profession. To record, without modification, of the *New England Journal of Dentistry* that it is "no more" is a mistake. To state, in an unqualified manner that it has "succumbed" is—if the word is used intentionally and with an intelligent appreciation of its true meaning—an egregious mistake.

The New England Journal protests that it is not ready for an obituary notice; that it is not "deceased." Neither have its editors "dried" their "pens." "Self-denying labors have not ceased" and "weary brains" refuse the "rest" to which they are consigned.

A simple change in names or, other words, "getting married" does not warrant or justify a friendly cotemporary in the use of such terms as "deceased," "succumbed," etc. There is nothing of the kind involved in the transaction, and the editors of *The New England Journal* decline to be buried by means of sugar coated obituary notices. They have other "fallacies" to maintain and rejoice that the new arrangement affords a larger field in which to disseminate them.—*ArchivesofDen.*

TETANUS TREATED BY ETHER SPRAY.—Dr. Boutellier has communicated to the *Progress Medical* a case of traumatic tetanus and another of cholera treated successfully by him, with the application of ether spray to the spinal column. A man whilst driving struck his horse with the end of the reins, and received the *contaecoup* upon the third finger. A small wound, which bled profusely, was the result, and a week afterwards cicatrization was complete. However, his business called him out again, and he had to make a long journey when the weather was very cold On returning he felt great oppression, and two days afterwards he could with difficulty open his mouth, and in the night of the same day he was seized with constriction in the chest every five minutes, When Dr. Boutellier arrived, he found the patient motionless in his bed, the jaws tightly shut, and the lateral muscles of the neck contracted, episthotones well marked. A purgative was ordered, and pulverization of ether on the spine every hour for five minutes at a time. The next day the patient was notably better. Calabar bean according to the formula of Watson was also administered. From this time the attacks diminished, and the ether spray was kept up every two hours for a few days longer, when the patient was considered entirely convalescent. The second case was no less striking. A boy, æt. 11, was suffering from well marked chorea, for which he was treated with opium, bromide of potassium, arsenic, and calabar bean, for five weeks without the slightest advantage. It was then that the author thought of the treatment of Lubelski. Ether spray was applied to the spine morning and evening from three to five minutes at a time. The second day the boy was better, and at the end of a fortnight of the treatment all chronic symptoms had ceased, and never returned.

SULPHO-CARBOL, THE NEW ANTISEPTIC.—From the *London Med. Times* we learn that M. Pierre Vigier, the able writer of the "Pharmaceutical Contributions" in the *Gazette Hebdomadaire*, giving an account (in the number for Aug. 8) of a paper on a new antiseptic, read at the Societe de Biologie, by M. Ferdinand Vigier, a *pharmacien* of Paris, observes that the fact of its author being his near relative is an additional security for his examining the pretensions of the substance to an important position. The substance in question is orthoxyphenic-sulphurous acid, which may be more conveniently named *sulpho-carbol*, as more simply indicating a combination of sulphuric acid or phenic acid. The antiseptic and antifermentative properties of this compound are remarkable, and it has the advantage over carbolic acid of being soluble in water in all proportions, and of being neither poisonous nor caustic it is a syrup, rose-colored liquid, of a pungent odor, but no wise disagreeable in solution. It is votallized in a water-bath, and may be used for fumigation. It was discovered in 1841 by Laurent, and has since then engaged the attention of many chemists. Recently its properties have been investigated by M. F. Vigier, with the assistance and in the laboratory of M. Laborde, and its great antiseptic powers have been duly demonstrated. It may be given internally also, in syrup and water, in doses of from one to five grammes daily. Indeed, being an inoffensive product, its doses may be increased *ad libitum*, which of course is not the case with carbolic or salicylic acids.—*Med. and Sur. Reporter*.

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ARTICLE I.

A METHOD OF MOUNTING A PORCELAIN-FACED CROWN.

BY A. O. HUNT, D. D. S., IOWA CITY.

[**Read before the Iowa State Dental Society, May 1884.**]

One very important part of dental technics is that of crown setting.

There are many methods of doing this, some of which are very practical and easy of accomplishment when conditions are favorable.

When roots are crowded, the surrounding parts are subject to a class of diseases that are difficult to treat unless the pulp canal can be utilized, through which to pass the various therapeutic agents to be employed.

By the usual method of attaching a crown, it is necessary to remove it whenever treatment is to be resorted to Such removal means destruction to the crown ; as one well adjusted will in nearly all cases be so badly mutilated in the operation that it is much easier to make a new one han to restore an old.

Again, most of the methods are adapted to roots that are firm and after being cut off to the line of the gums, retain all their normal strength and form. It is often necessary to operate with roots whose buccal, lingual or lateral walls are disintegrated nearly or quite to the alveolar process.

The interior of the root may be coned out deeply, exposing frail and ragged edges, with the gum tissues overlying these edges.

The method I shall attempt to describe is one suited to these latter cases, *i. e.*, roots with frail and ragged edges, with the gum tissues overlying and filling the crown end. The following method will overcome most if not all of the difficulties in the way of success, and allow the setting of a crown that is durable, and useful. To get good access to the root, first pack it with soft gutta-percha pellets, pressing the material out over the edges and building on until the gum is displaced, so that when the gutta-percha is removed a large and free opening is had through the gum, and the edges of the root are fully exposed. This packing should remain two or three days. With a thin platinum ribbon (33 gauge) form a tube, place it over the end of the root and bind with fine wire, twisted until the platinum conforms to the shape of the root.

If the edges are too frail fill with amalgam in the following manner:

First roughen the inner side of the root or cut ledges if admissible with an engine burr. Select a broach that will enter the apical foramen. Leave this in the canal while inserting the amalgam. Restore the contour if lacking at the same time, and withdraw the broach carefully.

The channel thus formed will be a guide in drilling. Wait a day or two for the amalgam to harden; now the end of the root will present a firm face and shoulder, nearly as good as though the walls had never been destroyed.

With tube over root in place, prepare enough plaster (plaster two parts, sand or asbestos one part,) and take an impression of this and adjacent teeth, seeing that the plaster fills the tube down to the root.

When the impression is removed with the band, dry thoroughly. Pour into it Babditt metal, (Grade C,) or Watts or Reese metal.

Break away the plaster and remove the platinum tube, trim away in the metal that portion that corresponds to the gum tissue, leaving a correct model of the end of the root over which to place the permanent band of gold. Fit this tightly to the model, turning a flange over the labial edge, as a rest for the porcelain face. Now prepare the following: Hollow platinum wire (No. 60,) a twist drill a trifle smaller than the wire, cutting end cone shaped, so that it leaves the bottom of the drill-hole in that form.

Hard wax composed as follows: Gutta-percha one part, pure beeswax two parts, and sufficient resin to form a mass that will be hard at the temperature of the body. Platinum rolled foil (say No. 45 guage, to be used as backing for the crown.) Put the gold band in place over the root in the mouth, so that the flange is below the gum line.

Follow the pulp canal with the drill, securing as deep a socket as may be.

Select a suitable plain plate tooth (pins cross-wise preferred,) grind to fit, resting the cervical end on the flange of the band.

Lay a piece of the platinum foil on a soft wood surface and press the tooth pins through it. Burnish the foil down to the tooth and over the approximal, cutting the cervical edges so that at the latter point the foil will be between the tooth and the flange. Adjust the tooth so prepared to its place, driving the platinum tube or wire into the drill hole, allowing it to extend to the cutting edge of the tooth. With a hot instrument (flat burnisher,) melt hard wax about the tube, inside the band and on the backing of the tooth.

Arrange everything now as you would have it when finished. With plaster and sand, or asbestos, the same as before, take an impression. Should the tooth and band not draw out with it they can be removed and put in place in the impression.

Fill all with a mixture of plaster and sand. Remove the cup and trim down on the lingual side, exposing and removing all the wax. Bend the tooth pins up close to the tube, fill the tube with a piece of broom straw dipped in wet plaster.

Flow solder around these and down over the thin platinum backing until the whole is united to the band at the flange, and a good body of it on the backing. Fit a shell of gold the same grade as the band to the lingual side, resting on the band and fitting the backing closely at the approximal edges and around the tube, which should extend outside of the shell. Solder this in place and finish with files, etc., to a contour corresponding to the tooth being mounted.

Whatever of the tube projects, file off as surplus material.

Place the crown, when finished, in place, perfect the articulation. Remove and attach with cement (Caulk's Diamond preferred.) When mixed to the consistency of cream it gives ample time for the work, and sets hard and firm. Remove the pieces of broom corn and plaster from the tube; free access can thus be obtained through this channel, for treatment now or at any future time.

Fill the tube nearly to the end with cement, closing up with a gold filling.

The advantage of this method will be readily seen. It can be used on any tooth, in any part of the mouth.

In bicuspids with two roots, two tubes may be used; and the shell for the lingual side, formed over a piece of dry hickory or other hard wood or swaged over metal dies. In molars a tube may also be used for each root.

Another advantage is in having a hollow pin or wire, nearly the combined length of root and crown, firmly imbedded in cement, giving great strength with lightness. Another, the crown is easy of construction, requiring only those instruments usually found in an appointed dental office. Still another, it is durable; and the manipulation is postive and adapted to any shape of root.

In one case where this method was employed the root was but ⅜ of an inch in length (a superior second bicuspid) and quite loose, accompanied with ulceration. So frail that any method of band crowning would have been doubtful.

By this method and with good results in treatment after seventeen months of usage, the root is firm, the crown unimpaired, and all doing the service of a good tooth.—*Archives of Dentistry.*

ARTICLE II.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

At the monthly meeting of this society, held on December 1st, Mr. J. S. Turner, president, in the chair.

The Curator announced that the Council sanctioned the purchase of a very good skull and almost the entire skeleton of a gorilla.

Mr. McAdam, of Hereford, described a mode of regulating teeth by fitting a gold band, and fixing this to the tooth by means of an osteo cement. The band could be furnished with hooks, lugs, or studs, fixed in any required position, and could thus be readily acted upon without the risk of ligatures slipping up under the gum.

Mr. Walter Coffin showed a photograph and models of the mouth of the last surviving member of the Russian Kostroma family, a boy now aged fourteen. He was probably the most hairy member now living of the human race, his face being strongly suggestive of a Scotch terrier. He was almost edentulous, having only two canines in the upper jaw and three incisors in the lower, all temporary teeth.

Dr. St. George Elliot exhibited and presented to the museum some very curious dentures of native Japanese manufacture. They were carved out of hard wood, the

the front teeth being made of quartz pebbles carefully ground down, whilst the place of the molars was occupied by copper nails, by means of which most of the mastication was accomplished. Dr. Elliott said the art of making suction plates had been known to the Japanese for two hundred years, though the Chinese had no idea of it.

A communication from Mr. Oakley Coles on the use of Cocaine in Dental Surgery was read by Mr. S. J. Hutchison. He (Mr. Coles) had received a small quantity of this drug, and had made some experiments with it which fully confirmed the statements which had been made with reference to its remarkable anæsthetic properties. One application of a 20 per cent. solution would allay sensitiveness in the dentine, and two applications at intervals of five minutes would suspend for a time the sensitiveness of an exposed pulp. It had been stated that, if used in sufficient quantity and of adequate strength, cocaine would enable an operator to remove a tooth without pain; of this he could not speak from personal knowledge, but there could be no doubt as to its utility in dental surgery. The form in which it could be best applied could only be determined by experience. It was soluble in water, glycerine, chloroform and the essential oils, but not in ether; that which he had been using dissolved in oil of cloves. Possibly it might act best in the cavity of a tooth if used in powder or in the solid crystaline form. This, as well as the limits of its power as a local tnæsthetic, coul only be ascertained by careful experiments.

Mr. S. J. Hutchinson remarked that he found the application of a 20 per cent. solution removes the sensitiveness of an exposed pulp.

Mr. Woodruff and Mr. Hern said they had tried the four per cent. solution used in opthalmic practice, but without any beneficial effect.

Mr. Storer Behnett said he had found a four per cent. solution quite useless. He then tried a mixture of vaseline with 10 per cent. of the alkaloid, and found that even after being sealed up in the cavity for 48 hours, it had produced very little effect on the sensibility. He then tried the same 10 per cent, preparation and left it a week. This had a much better effect, the patient remarking that "the tooth felt numb." He intended to try a 20 per cent. solution of the muriate, which he believed had been found much more efficacious than the uncombined cocaine. At present the price was an obstacle to its being used at all extensively, that of cocaine being 10d., and of the muriate 2s, 6d. a grain.

Mr. J. Bland Sutton, F. R. C. S., then read a paper on "Comparative Dental Pathology."

After giving some details respecting certain cases of dental disease in extinct mammals, Mr. Sutton showed two very interesting specimens of odontomes in marmots. In the first case, four odontomes were found, one in connection with each of the incisor teeth; in the second, a a large odontome was found in connection with one of the lower incisors.

In his paper read twelve months ago, he had called attention to the fact that, comparatively trivial as were the effects of alveolar abscess in man, in animals it not unfrequently proved fatal, through the purulent secretion being inspired,and setting up septic phneumonia. He now related the case of a Kangaroo, the death of which had resulted from general pyæmia secondary to alveolar abscess. The most serious local effects resulting from this cause which he had met with were seen in an Exquimaux dog. An alveolar abscess had arisen in connection with the left lower second molar; necrosis of a considerable portion of the outer surface of the jawbone had followed, so as to lay bare the sockets of the premolar teeth. The burrowing pus had also involved the sectoral tooth, which was necrosed and its fangs exposed. On the right side the sectorial and premolar teeth had disappeared, and thcir alveoli had undergone absorption.

He had also on the former occasion drawn attention to the fact that premature shedding of teeth in animals might result from constitutional disease. He now gave further examples in support of this. In a crab eating opossum affected with a disease resembling mollities ossium, the teeth were so loose that on detaching the mucous membrane they all came away with it, looking exactly as though they were rows of nails driven for half their length through a strip of leather. Animals affected with rickets were liable to loose their teeth owing to extensive absorption of the alveoli. He showed as example of this the skulls of a small species of lemur and of a marmoset. Ophidian snakes also, when kept in captivity, were very liable to lose their teeth from absorption of the "bone of attachment," by which, in these creatures, the base of the tooth is cemented to the jawbone proper. Besides being secondary to general constitutional disease, premature loss of teeth might also occur as the result of a local inflammatory affection characterised by extensive deposits of tartar, and absorption of the alveoli, with evidence of periostitis.

Cleft palate was a deformity which was not confined to man, but might occur in animals also under certain circumstances. Thus some years ago, several of the lion cubs born in the Zoological Gardens had cleft palates. The parent animals were at that time fed entirely on horse flesh, the bones of which were too hard even for the jaws of a lion or tiger; but after goat's flesh had been occasionally substituted, well formed cubs were born, the animals being now able to obtain a proper quantity of earthy phosphate. Frequently recurring parturitions, by causing an increased demand for lime salts, would also tend to produce this deformity in animals, and he was of opinion that the same cause might operate to produce it in man.

The subject of cleft palate in man and animals had been made the theme of some very interesting observations by Professor Paul Albrecht, of Brussels, who endeavoured to show, by reference to cases of cleft palate, that the premaxillary bone is developed from two centres, instead of one, as has been generally supposed. He further points out that in some cases where the cleft in the palate is double, so as to isolate the inner portion of the pre-maxillary bones, the median piece may develop two incisor teeth in each half, and yet an incisor tooth may be found lodged in a socket, and separated from the canine by the maxillo-pre-maxillaro suture. From this, Professor Albrecht argues that man naturally inherits three incisors on each side, but that in the course of development the middle one on either side is suppressed. In these cases of cleft palate with an enlarged median portion there is a greater local supply of blood than usual; this extra supply of nourishment enables the usually suppressed second incisor to be fully developed, and show that that which is usually considered the second incisor is really the third. Cases confirmatory of this view had been met with and recorded by other observers, and it seemed probable that the so-called supernumerary incisors which were not very unfrequently met with might really be due to the persistence of one of these usually abortive teeth.

Comparative Dental Pathology was a wide subject and material was abundant. He hoped, therefore, that on some future occasion he might have an opportunity of bringing before the Society some further facts in connection with it.

A Discussion followed, after which the Society adjourned.—*Dental Record.*

ARTICAL III.

THE MATRIX IN AMALGAM FILLINGS.

BY G. C. CABOLL, M.D.S., BUFFALO, N. Y.

[Read before the Seventh and Eighth District Dental Societies of New York, at Rochester, October 28, 1884.]

It should be an axiom wiht every member of the dental profession that " anything that is worth doing at all, is worth doing well." In the years past during what might be termed the rise and progress of dentristry, from empiricism to its present elevation, on which it rests a demonstrated science; and is accorded that rank, its members have devoted themselves, and justly too, to the solution of the more difficult problems that were successively presented, and ignored in many instances the claim to their attention of the simpler ones. Thus it is to-day that the art of gold filling has, by the study of the character of gold, the invention of instruments, the devising of the thousond and one accessories, reached a high degree of perfection ; but with many operators who can boast of success with gold it has been obtained to the exclusion of a proper knowledge of the working of other materials, and thus it is that many, and I might say the majority, of successful dentists do not make creditable operations with the plastic fillings. They are considered too simple ; can be done too easily. Most dentists think it does not pay to adjust the rubber dam for an operation that is going to require but a few moments to complete.

And this brings me to the subject of this short paper: "The Matrix in Amalgam Fillings." My advocacy of the use of the matrix is well known, but it has been chiefly with gold, claiming that with it approximate fillings can be introduced in less time, with greater ease, and far more certainty, than without it. I make the same claim for plastic metallic filling. It is claimed by the best authorities that the minimum of mercury in amalgam fillings insures the better result, so that with the mixture of the desired proportions the amalgam must be moulded to insure facility in handling it and in approximate cavities the introduction in this form is rendered very difficult on account of the mass resolving itself into a powder, and the the impossibility of applying sufficient force to condense it without escaping from the proximal margins.

We know that crown cavities are easier to fill than those on the proximate surfaces, easier to keep dry, easier of access, and easier to finish, and this holds just as good with plastic materials as with gold.

The operator who aims at uniformity of excellence in all his work, will not fail to avail himself of every means to secure the desired end, and to that end the matrix is an an indispensable adjunct in filling teeth with amalgam. It is not desirable to use material for its cheapness and the rapidity with which it can be worked to the exclusion of all other qualities, but rather we should aim to procure that which will bear the highest test for color, edge-strength, and freedom from shrinkage; but when we have the material that possesses all these qualities, we may fail because we neglect to use the means necessary to bring out these qualities, thus, if obliged to add an excess of mercury to render the mass sufficiently plastic to insure its introduction into a proximate cavity, we do it at the expense of strength and limit of shrinkage. If we use an amalgam that will possess sufficient strength under such conditions, we must sacrifice color. In my own practice I use Dawson's amalgam, or white alloy, as it is called, add the mercury by weight, triturate the mass in a mortar, and mould it for use, introducing it as soon as possible after preparation, frequently using the mallet in condensing and perfecting the amalgamation. After the cavity is prepared I invariably adjust the rubber dam, using the same care in the preliminaries as I would with gold, and expect to have a filling that will admit of finishing at the same sitting, one that will not shrink or discolor, and that will take a durable polished surface and stand the action of mastication.

Such a result I could not accomplish in proximate cavities without the aid of the matrix. Such a result cannot be reached without scrupulous care in all the details of the operation. With care in the selection of the b material, and the observation of all the requirements, such a thing as an artistic amalgam filling may be produced, and, although it is only an amalgam filling, "if it is worth doing at all it is worth doing well."—*The Den. Adver*

ARTICLE IV

THE CAUSES AND PREVENTION OF DENTAL CARIES.

Dr. Henry Sewill has written for the *Lancet* an article in which he sums up the causes and means of prevention of caries of the teeth. Caries is a process of disintegration, invariably commencing at the surface, proceeding inward, and due entirely to external agents; enamel and dentine are passive under this process. The predisposing cause of caries are: first, innate structural defects in the teeth, which render them more susceptible to the action of agents; secondly, all such diseases as are attended with vitiation of of the oral secretions, or which tend to the formation and deposit of acids and the accumulation of products of decomposition within the mouth; thirdly, to crowding and irregularity of the teeth, due to smallness and malformation of the maxillæ. The direct agents in initiating caries are acids, the products of chemical change and fermentation set up in fragment of organics matter which are commonly present in the mouth and lodge between the teeth. These acids are often assisted in their action by acid mucus secreted by unhealthy gums, acid saliva in some diseases, acid eructations from the stomach in others.

Enamel, according to Dr. Sewill, is always the starting point of caries. The enamel organ—that portion of a developing tooth from which enamel is formed—consists of epithelial cells, and it retains its epithelial character throughout the process of calcification. The completed tissue results from direct calcification of the internal layer of cells. Vascular papillæ arise from the contiguous layer of the dental sac, penetrate to a slight depth the external layer of cells, and convey nutriment to the developing tissue. On completion of the enamel these external cells, with the vascular loops, undergo atrophy and disappear.

Dentine consists of a homogeneous calcareous matrix with a basis of fibrous tissue. It is permeated by minute tubes occupied by fibrils which endow the tissue with sensibility, and which form the sole protoplasmic element in dentine. The bearing of these anatomical and physiological considerations upon the subject of caries depends upon the obvious fact that enamel is devoid of any physiological mechanism whereby either vital or pathological changes could be brought about in it, and that whatever changes enamel undergoes are induced by external agencies. It is a calcareous mass, devoid of cellular, elements, and incapable of imbibition. The one dark spot in our knowledge of the remote causation of caries, according to Sewill, is found in the first predisposing cause: inherent structural weakness of the tissues. The enamel varies indefinitely, in different individuals, in the quality of its calcareous matrix; we often, in fact, encounter teeth whose soundest enamel is chalklike in its softness. Teeth of general defective character often present patches of surface, the enamel of which consists merely of an imperfectly united mass of granules. Sometimes, in places, enamel fibres are penetrated at their centres by minute tubes which render the tissue at such places porous. Honeycombed teeth have enamel full of small pits and fissures, and there is scarcely a set of teeth to be found in which here and there, in one or more teeth, an isolated crack or cleft, a solution of continuity of the tissue, does not exist.

While our knowledge of origination of mal-development of teeth is very incomplete, there is evidence that in all races of advanced civilization there is a notable deterioration in dental development. Comparative disease of the organs of mastication has led in civilized races to decrease in size and strength of the whole apparatus of mastication —jaws, muscles, and teeth. This fact has been demonstrated by Professor Flower, who shows by examination and measurement of many thousand skulls that there is a gradual diminution in the size of the teeth from the anthropoid apes through the lower races of man to the European. It has been argued that progressive dental deterioriation may be brought about by the overwhelming demand upon upon the vital powers by the growth of the brain and its increased exercise in modern life. The brain and the jaws are alike fed from the common carotid artery, and it is urged that the demand for blood by the growing and working brain leads to imperfect supply of the masticatory organs. Again, dental deterioration has been ascribed to improper and imperfect feeding of children, to insufficiency in the the food of lime salts, the proper pabulum of developing teeth. If this were true the whole osseus system might be expected to be ill-developed, and it would be impossible to find a single individual with a solid skeleton. Perhaps, with very rare exceptions, there is no modern people displaying general progressive physical degeneration, and which is accompanied by ill-developed teeth. But it must be recollected that there has been among the population a constant augmentation in the number of the physically imperfect. Vast numbers of the phthisical, the scrofulous, the rickety, and congentially syphilitic who would formerly have perished in childhood, are now by science kept alive, and these imperfect types are all associated with faulty dental development.

With regard to the association of defective dental tissues with particular diatheses, we find ourselves on firmer ground. Hereditary syphilis leads often to the imperfect formation of tooth tissues. The children of syphilitic parents are apt to have the enamel soft and easily broken down.

Imperfect dental development is also found in the majority of cases of scrofula. One class of patients, the subject of phthisis of tubercular origin, almost invariably presents faulty dental tissues. This is the type most frequently found in females, in which there is often, with a fragile form, considerable facial beauty, in which the eyes are large and expressive, the complexion fair, with the blue veins visible beneath the skin. In this not uncommon type Dr. Sewill has invariably found the teeth, though well shaped and fair to look at, covered with the softest enamel. With rickets, too, inherently defective teeth are invariably found.

Premising that but little can be done to prevent dental deterioration, except by the promotion of national sanitation in the broadest sense, and that any treatment designed to inflnence beneficially the developing teeth of the fœtus in utero when the parents nave been the subjects of the diatheses or cachexiæ above mentioned can be of little effect, the writer considers other factors in the causation of caries, *viz.*, vitiation of the buccal secretions. The diseases of our times are largely those which give rise to derangement of these secretions, for many or most of them are either diseases of the digestive organs or maladies accompanied by disturbance of the organs of digestion. In this way we may account for the prevalence of caries among certain portions of the community whose dental tissues are not of tho worst structure The constant presence of dyspeptic troubles in some classes of factory operatives is undoubtedly enough to account for the rapid tooth decay from which they suffer. Moreover, some of the diatheses, notably a variety of scrofula attended with a chronic condition of congested oral mucous membrane, and rickets, are often accompanied by a secretion of viscid saliva and acid dyspepsia. The broad facts now before us are: first, that without acid, without vitiation of the secretions of the mouth, caries is impossible; and secondly, that acid capable of dissolving enamel—and of more rapidly dissolving it in proportion as the tissue is soft and ill-made—is always being formed in greater or less quantity in every mouth in which absolute cleanlinees does not exist.

In combating this second cause of caries, the patient's general health must first be considered, and we must remember that probably every lapse from a perfect standard will be attended with a proportionate vitiation of the secretions of the mouth. The question of the general health should then first receive attention and dyspeptic troubles be remedied. But even with perfect health and perfect dental tissues caries may appear if organic debris be allowed to remain and decompose in contact with the teeth. The first thing, therefore in every case is to insure mechanical cleanliness by the use of a tooth-brush and tooth-pick, which latter should be of quill or wood only. When the teeth are crowded or of delicate structure, the use of floss silk passed between the teeth and rubbed to and fro supersedes the use of the tooth-pick. The tooth powder recommended by Dr. Sewill is as follows: Take of Castile soap, two drachms, powdered orris-root, half an ounce, borax, two drahms, and prepared chalk, two ounces. Mix and rub together; flavor with a few drops of oil of cloves and lavender. Instead of the perfume, Dr. Sewill has lately added a few drops of carbolic acid to each ounce of the powder, the whole being flavored with eucalyptus oil. The mixture should be used freely with a wet tooth-brush, the mouth to be freely rinsed with water at intervals during the brushing. In all cases where great vitiation of the secretions is present, as in the dyscrasia of pregnancy, extra means should be adopted to prevent putrefaction and fermentation in the deposits which form upon the teeth. A useful mixture for this purpose is made by dissolving a grain of bichloride of mercury in an ounce of eau de Cologne or tincture of lemon. Mix a teaspoonful of this with two-thirds of a wineglassf of water and rinse the mouth with it several times a day.

As for the caries which depends on crowded jaws and irregularity of the teeth (favoring the retention of food-debris in contact with the teeth), the most beneficial measure to prevent caries in these cases, especially when the teeth are of imperfect formation, is the extraction of the six-year-old molars as soon as the second molars are well in place. The first permanent molars are generally the worst-made teeth of the whole set, and in cases where room is urgently needed it is seldom that their preservation is possible. Removal of these teeth allows an equal and sufficient spreading apart of all the teeth and prevents crowding. The operation of filing the contiguous surfaces of canines and incisors as an effectual means of cutting short the progress of incipient caries in crowded jaws is too well recognized to need comment.—*Medical Record.*

ARTICLE V.

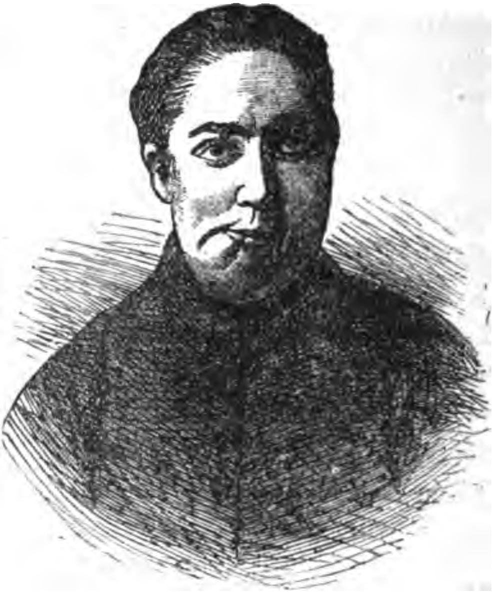
REPORTS OF HOSPITAL AND SURGICAL PRACTICE IN THE HOSPITALS AND ASYLUMS OF GREAT BRITAIN, IRELAND, AND THE COLONIES.—UNIVERSITY COLLEGE HOSPITAL.

FOUR CASES OF CLOSURE OF THE JAWS, THREE OF WHICH WERE TREATED BY REMOVAL OF THE CONDYLE AND NECK OF THE JAW, A FOURTH BY ESMARCH'S OPERATION.

(Under the care of Mr. Christopher Heath.)

[From notes by Mr. Pollard, Surgical Registrar.]

Case 1. *Closure of Jaws, due to Enlargement, probably from Rheumatoid Arthritis, of the Left Neck and Condyle of the Lower Jaw: Excision of the Upper End of Ramus: Great Improvement.*—E. B., aged 36, female, was admitted on February 26th, 1883. She had had small-pox about twenty years earlier, and had occasionally suffered from chronic rheumatism in the elbows. In 1872 she had an attack of partial hemiplegia on the left side, and she then noticed that her face, which had previously been symmetrical, was drawn to the right side, and that she had difficulty in opening her mouth; the displacement of the jaw to the right side had been increasing ever 1872. She had gradually recovered the use of her limbs, but not entirely that of the left side of her face.



Her state, on admission, was as follows. The lower jaw was displaced to the right, as shown in the illustration, so that the middle of the symphysis lay vertically beneath the centre of the right pupil when the eyes were directed forwards. The symphysis was unaltered in shape. The right angle of the jaw was only half an inch below the lobule of the ear, and the continuation backwards of a line along the lower borderof the jaw passed over the tip of the mastoid process. The right condyle was apparently buried beneath the zygomatic arch, and, in place of the normal elevation, there was a depression opposite the articulation. Betwcen the left angle of the jaw and the upper border of the zygomatic arch there was a hard bony mass continuous with the jaw, and extending forwards to the molar bone, with the lower border of which it merged. The whole of the outer surface of this enlarged ramus was smooth, and over it the masseter muscle appeared to be tightly stretched and united to it by firm tissue.

The patience experienced abnormal sensations in the skin of the whole left side of the head and neck, where also tactile sensibility was diminished; there was partial paralysis on the left side of the face, but the limbs of that side were as strong as those of the other.

March 14th. The patient being under the influence of chloroform. Mr. Heath tried to move the jaw, but, failing to make any material alteration, he made a vertical incision along the upper two-thirds of the posterior border of the ascending ramus of the jaw, and extending down to the bone, He then stripped off the soft parts from the front and back of the bone, and divided the latter with an Adam's saw. The soft parts were next cleared from the upper fragment, which was, with some difficulty, leveled out of its position with an elevator, bringing away with it a small portion of the temporal muscle; the wound was mopped out with a solution of chloride of zinc, a plug of lint, soaked in the same, was left in it, and a dressing of iodoform and salicylic wool was applied outside. The portion of bone removed consisted of the enlarged condyle, the neck of the left ramus, and a small portion of the posterior border of the coronoid process. At the site of section the bone was natural in size and consistence, but above that it became expanded into a broad oblong mass, with a rough flattened surface, measuring 1¾ inches from before back, and about 1 inch across. The outer surface of the mass, although nodular over the upper half, was smooth, and covered by a layer of dense bone, varying from 1 to 2 millimetres in thickness in front to a mere shell on the posterior border. The cancellous tissue filling the interior of the mass was in greatest quantity at the upper part, but the spaces were everywhere small, and the spicula of bone thick, so that the whole tissue was dense.

March 16th. The plug of lint was removed. There was a good deal of redness and swelling around the wound, extending to the cheek. The wound was syringed out and redressed.

The subsequent progress of the case was marked by increase of the swelling, and the formation of a slough at the bottom of the wound, which separated on March 27th, she was free from pain, and the sensation on the left side of the face was rather better; but she was not able to close the left eye completely. The swelling of the face gradually subsided, and the patient nearly regained the power of closing the left eye. She was sent to the convalescent hospital at Eastbourne on April 12th.

Dr. Williams of Sherborne reported, some months later, that the movements of the jaw were very satisfactory, and that the patient had been able to take a situation, which her unsightly appearance had previously prevented.—*The British Med. Jour.*

ARTICLE VI.

THE NEW LOCAL ANÆSTHETIC—COCAINE HYDROCHLORATE.

BY J. EDW. LINE, D. D. S.

[Read before the Rochester Dental Club, Nov. 11th, 1884.]

The comparatively recent statements in regard to this drug as a local anæsthetic, the present impossibility of obtaining a grain of it even for experimental purposes, and its very high price, make it an object of rare interest to every one, and especially to the dentist—not, however, because of what is known of it as a dental therapeutic so much as what is suspected and expected of it as an aid in our work upon sensitive organs and tissues.

As its name suggests, it is the product resulting from the treatment of cocaine with chlorhydric acid. Cocaine is the alkaloid obtained from the *Cuca* of the South American Indians, or *Coca* of the Spaniards, and coca is a plant of the natural order Erythroxylaceæ, resembles the black thorn, and grows to a height of six or eight feet. The leaves are used as a masticatory in the western countries of South America, and are the parts in which is found the alkaloid, "to which cuca owes its special properties." Good specimens of the dried leaves "have a strong tea-like order; when chewed they produce a sense of warmth in the mouth, and have a pleasant, pungent taste. Bad specimens have a camphoraceous smell, * * * and lack the pungent taste." The leaves are used by the South American as generously and as industriously as prepared tobacco is by persons nearer home—the figures being placed at 8,900,000, and the chewers in Bolivia, Peru, Ecuador, Columbia, and Rio Negro.

Cuca is said to be "a powerful stimulant of the nervous system; it enables tatigue fatigue to be borne with less nourishment and greater ease than ordinarily, and diminishes the difficulty of breathing in ascending mountains." It is also said to be "a remedy for rheumatism and headache." Poppig, in his *Travels in China and Peru*, says the cuca-chewing habit is "as dangerous to health as opium-eating;" and Lloyd in the *Journal of the Royal Geographical Society* (1854,) speaks of it as a "poisonous narcotic." Other observing travellers and experimenters, however, testify to the contrary, and seem to commend rather than condemn the leaf and its use by human beings. The best kind of argument against Popping and Lloyd's statements is found in the number who habitually use the stuff, and the further fact that an able bodied South American Indian easily and habitually gets away with from two to three ounces in a day.

Cocaine ($C_{16} H_{19} NO_4$) is an alkaloid of *Erythroxylon Coca,* and the substance to which *cuca,* as already stated, owes its special properties. It was discovered in '59 by Niemann. "It is highly poisonous, and its physiological action is apparently identical with that of theine, cafeine, guaranine, and therobromine, which all (as shown by Bettet in the *EdinburghMedicalJournal,* '73) * * * induce a series of symptoms affecting the nervous, respiratory, circulatory, vasa-motor, and glandular systems."

The muriate of cocaine, or cocaine hydrochlorate, is found mentioned in Merck's catalogue. It had been known a year or more to laryngologists as an excellent application to the vocal cords, its anæsthetic effect facilitating examinations. It was the observance of this fact that led young Koller of Vienna to experiment with it upon the eye, and it was he who supplied Brettauer with the vial of the solution used by him in eye operations before the Ophthalmological Congress at Heidelberg last September.

According to Dr. H. D. Noyes, of New York, one of the special correspondents of the *Medical Record*, it was the most notable thing presented on that occasion. He says: "Two drops of the solution (a two *per cent.*) were dropped into the eye of the patient at the first experiment, and after an interval of ten minutes it was evident that the sensitiveness of the surface was below the normal, then two drops more were instilled and after waiting ten minutes longer there was entire absence of senstbility; a probe was pressed upon the cornea until its surface was indented, it was rubbed lightly over the surface of the cornea, it was rubbed over the conjunctiva bulbi, and of the conjunctiva palpebrarum; a speculum was introduced to separate the lids and they were stretched apart to the uttermost; the conjunctiva bulbi was seized by the fixation forceps and the globe moved in various directions. In all this handling the patient declared that he felt no unpleasant sensation, except that the speculum stretched the lids so widely asunder as to give a little discomfort at the outer canthus. Before the experiment his eye was showd to possess the normal sensitiveness, and the other eye, which was not experimented on, was in this respect perfectly normal. The solution caused no irritation of any kind, nor din it at all influence the pupil. The anæsthetic influence seemed to be complete on the surface of the eye, and it lasted for about fifteen minutes, and the parts then resumed their usual condition."

Immediately upon the publication of Dr. Noyes' letter, specialists sought the dealer, the major part of them only to learn that the whole stock had been gathered in by earlier comers. A few of the more fortunate ones have already been enabled to put the drug to the test and publish their results. Prof. C. P. Agnew and Drs. William O. Moore and James S. Minor, who devote themselves to the treatment of the eye and ear, corroborate all that Dr. Noyes has said, and add new cases and new interest to the history of this most welcome agent. Dr. Agnew, in a case of convergent squins in a five year old, cut the scleral conjunctiva and internal rectus muscle; also the same muscle in a eleven year old, and in both without causing pain. Another case (six years of age) of the same kind failed because of the "nervous apprehension" of the child. Examinations only were made in two cases, in one of which the parts were sensitive to a remarkable degree to both torch and light—a case of laceration of the eye-ball, involving the sclerotic. The other was a case of double cataract—sensitive, of course, to touch only. Dr. Moore scraped an ulcer in a Chinaman's cornea, freely cut the conjunctiva in another patient, bringing the cut surfaces together by three sutures, and in a child of seven cut the internal rectus. Dr. Minor removed stitches from the conjunctiva of a ten year old boy, put there a few days before under other and less pleasant circumstances; and in a case of cataract, in a woman of fifty, made a large section of the cornea, and accomplished cystotomy and the removal of the lens easily and painlessly. All of which shows that cocaine hydrochlorate is prompt in its action, and effective even at some distance from the surfaces to which it is applied.

Dr. Geo. F. Shrady says: "It is quite certain that in those numerous cases in which local anæsthesia is necessary for minor operations in surgery, gynecology, laryngology, otology, and even dentistry, this anæsthetic will be tested. Especially would it seem to be indicated in loose parts of the body which are covered by mucus membranes and plentifully supplied with sensitive nerves." A week ago last Wednesday, Prof. W. M. Polk, of N. Y., performed painless operations upon two women for laceration of the neck of the uterus. He is now engaged in experimenting with the drug to determine its effects when applied to the cervix and vagina in the exceedingly distressing pains of the first stage of labor.

Our own interest in cocaine hydrochlorate dates from the 20th of October, when we read the reports of Agnew, Moore and Minor. In our innocence we applied to a local drug firm for some of it, and was informed that they were not only without it, but did not know what it was. It was found in their copy Merck's catalogue as the alkaloid only, and worth $4.00 per 15 grains. This firm wrote immediately to Merck's agents in New York, and two days later got for answer: "Have cabled for it."

As a consequence we are obliged to suggest a few of its probable applications in dentistry, instead of giving, as we had hoped when we said we would furnish a topic for this evening, the results of a series of experiments.

In tooth-extraction it may not be efficient, except perhaps to obtund the sensitiveness of the parts to which the beaks of the forceps are applied. As a remedy for tooth-ache, whether from an exposed pulp, or one whose decomposition has been interfered with, it promises well. And from what has been done by the oculists we may rest assured of its effectiveness in cases where the use of the lance is called for, as preliminary to tooth-extraction, envacuation of abscesses, scarrification of the gums, and the removal of abnormal growths. It seems, too, that it must work satisfactorily as an application to the gums previous to the introduction of the peg-wood wedge. But of all things calling most loudly for suspension of sensation, dentine ranks first, and if cocaine hydrochlorate meets this want, it will supply one much as well as long felt.—*Odontographic Journal.*

ARTICLE VII.

PULP-CAPPING AND TREATMENT OF PULP-CANALS.

BY J. H. BEEBEE, ROCHESTER, N. Y.

[Read before the N. Y. 7th and 8th District Dental Society, Oct, 1884.]

The old subject of pulp capping and treatment of empty nerve canals is well worn, and it is very difficult to advance in this direction anything new.

I will first describe my ideal of a pulp cap: It must be disinfectant, antiseptic, antiphlogistic, and a non-conductor of thermal changes; it must also fit the surface covered, accurately, and adhere to it; at the same time it must be absolutely unyielding.

For the purposes of disinfection, and as a destroyer of germs of tooth decay, regardless of the nature of the latter, I have found nothing that is more efficient than the old perfumery of the dental office—creosote.

I am aware that very many of our practitioners have entirely banished it from their offices; but where an article has proved itself a good and faithful servant, it certainly seems poor policy to abandon it for anything less thoroughly subjected to the test of use.

As an antiphlogistic and antiseptic remedy iodoform has given the best results. I have seen the most obstinate cases of alveolar abcess promptly succumb to its soothing influence, when everything else had failed: pulps in a high state of imflammation have knelt before it, and cavities so sensitive as to render excavation impossible have been rendered comparatively painless when this drug has been held in them for a time, beneath a temporary filling.

It will be remembered that one part of the definition of the pulp cap as given calls for a non-conductor of thermal changes. The disastrous effects produced by the action of heat and cold upon the pulp in close contiguity to a metallic substance is too well known to all of us. Perhaps the best non-conductors are those of a vitreous or glassy nature. If an attempt is made to melt a piece of any of the resins it will be observed that while the surface of the piece is liquified the inner portions will remain brittle and hard, showing that this form of force is not readily conveyed by the atoms of the material. Among the hardest of the resins we find gum copal; it possesses the desirable property of solubility in one of the most volatile of substances—sulphuric ether. Another substance highly possessed of the property of resisting changes of temperature, is the phosphate or oxychloride of zinc, especially the former.

It is, perhaps, needless to say that no pulp should be capped while in a state of imflammation, it must, if diseased, show a great readiness to return to health, or give good evidence of healthy condition before the operation is performed. Having carefully removed all extraneous and decayed matter, unless a small amount of the latter be left immediately over the point of exposure, the cavity should be thoroughly saturated with kreosote, and wiped dry; then a saturated solution of iodoform in sulphuric ether should be introduced, and dried by permitting the solvent to evaporate. This is followed by copal ether varnish, of a syrup consistency, which is to be dried thoroughly with the aid of a hot air syringe. If the point of exposure is large, it is my custom, before the varnish is dry, to introduce a piece of thin linen writing paper, cut the shape of the floor of the cavity, which is to be pressed down with an instrument until it adheres in every part; then I re-varnish, and dry as before. Over the whole is to be applied and allowed to harden, a thinly mixed paste of oxyphosphate of zinc. In case of large exposures or diseased pulps, it is best, of course, not to finish with metal at the same sitting, the operator using his judgment as to completely filling the cavity with oxyphosphate or gutta percha in the case of temporary completion.

The great value of the varnish is, of course, its non-conducting property, and the certainty with which, without pressure, it will adapt itself to the surface covered. But another and very great benefit is the protection of the sensitive tissue from irritant action of the phosphoric acid in the plastic material, and especially is this the case when the paper before mentioned is used.

Have we not in the above that which we most desire—a cap that seals hermetically : that is a non-conductor of heat ; that is rigid, and at the same time an arrester of decay, and soothing to the pulp, and preventive of all inflammatory action ?

The same remedial rgents are used in the treatment of pulp canals, and with satisfactory results. As before intimated, the most obstinate cases of alveolar abscess, either hidden at the apex of the root, or discharging through a fistula, rapidly improve when iodoform is presented to them. When all diseased action beyond the apical foramen has been removed, or is under control—and even sometimes when it is not, if there is a fistula for discharge, and the health of the patient is good, the canal should be thoroughly cleansed and dressed. It is not necessary to enlarge the canal unless it be extremely small, and it is desired to use a screw or other appliance for retaining a filling or crown. When cleanliness is ensured, apply kreosote as in pulp-capping, wiping thoroughly with cotton, wrapped in a nerve instrument. Next apply the ethereal solution of iodoform, and dry thoroughly ; now wet with alcohol, and having preciously cut some slim pointed pieces of gutta percha, force them one at a time into the ranal till it is filled. The alcohol will act as a lubricant, and will be forced out of the way, and in a short time the gutta percha will assume a consistency almost as firm as though it were solid. As I write, the thought has struck me that, perhaps, it might be well to use a thin sandrach varnish in place of the alcohol, and that would certainly make a solid and perfect plug*

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*Since the above was read, the writer has repeatedly used the varnish with the best of results.

Many practitioners prefer some of the various forms of the zinc plastics for filling the canal, but the experience of the writer is against them, as he has found that where pus comes in contact with such material, the plug is dissolved and a passage will be burrowed right through it. Then, too, they are not perfectly dense and non-absorbent substances. Gutta percha, however, is one of the best substances that can be used in the mouth, for it is able to resist the action of any and every fluid, be they corrosive or otherwise.

If I have presented anything that is interesting I am gratified; if nothing of interest, I thank you for your forbearance in listening to a short paper on a trite but hackneyed subject.—*Odontographic Journal.*

ARTICLE VIII.

ON COCAINE AND ITS HYDROCHLORATE.

Cocaine, the alkaloid of *Erythroxylon Coca* Lam., was discovered by Nieman in 1860, and afterwards studied by W. Lossen (1812,) who assigned to it the formula $C_{17}H_{21}O_4$.

The coca-leaf has been recognized as having qualities somewhat analogous to those of coffee and tea, its alkaloid, however, being entirely different from Caffeine or Theine, which has the composition $C_8H_{10}N_4O_2$. It has lately been brought into especial notice on account of its powers as a local anæsthetic, and there is reason to believe that it will prove a valuable addition to the Materia Medica of the Surgeon and the Dentist.

The coca-leaf is the great source of comfort and enjoyment to the Peruvian Indian; it is to him what betel is to the Hindu, kava to the South Sea Islander, and tobacco to the rest of mankind; but its use produces invigorating effects which are not possessed by the other stimulants. From the most ancient times, the Peruvians have used this beloved leaf, and they still look upon it with feelings of superstitious veneration. In the time of the Yucas it was sacrificed to the sun, the Huillac Umu or high priest chewing the leaf during the ceremony; and before the arrival of the Spaniards, it was used, as the cacao in Mevico, instead of money. After the conquest. although its virtues were extolled by the Yuca Garcilasso de la Vega, and by the Jesuit Acosta, some fanatics proposed to proscribe its use, and to root up the plants because they had been used in the ancient superstitions, and because its cultivation took away the Indians from other work. In 1569, the second Council of Lima, consisting of bishops from all parts of South America, condemned the use of cocoa, because it was a "useless and pernicious leaf, and on account of the belief stated to be entertained by the Indians that the habits of chewing coca gave them strength, which is an illusion of the devil."

In speaking of the strength the coca gives to those who chew it, Garcilasso de la Vega relates the following anecdote: "I remember a story which I heard in my native land of Peru, of a gentleman of rank and honor, named Rodrigo Pantoja, who, traveling from Cuzco to Rimac (Lima,) met a poor Spaniard (for there are poor people there as well as here,) who was going on foot with a little girl, aged two years, on his back. The man was known to Pantoja. and they thus conversed: 'Why do you go laden thus?' said the knight. The poor man answered that he was unable to hire an Indian to carry the child, and for that reason he carried her himself. While he spoke, Pantoja looked in his mouth and saw that it was full of coca, and as the Spaniards abominate all that the Indians eat and drink, as though it savored of idolatry, particularly the chewing of coca, which seems to them a low and vile habit, he said: 'It may be as you say, but why do you eat coca like an Indian, a thing so hateful to Spaniards?' The man answered, 'In truth, my lord, I detest it as much as any one, but necessity obliges me to imitate the Indians and keep coca in my mouth, for I would have you know that if I did not do so I could not carry this burden, while the coca gives me sufficient strength to endure the fatigue.' Pantoja was astonished to hear this, and told the story wherever he went, and from that time credit was given to the Indians for using coca from necessity and not from vicious gluttony."

The coca plant (*Erythroxylon coca*) is cultivated between 5,000 and 6,000 feet above the level of the sea, in the warm valleys of the Eastern slopes of the Andes, where almost the only variation of climate is from wet to dry, where frost is unknown, and where it rains more or less every month in the year. It is a shrub, from four to six feet high, with lichens, called *lacco* in uichua' usually growing on the older trunks. The branches are straight and alternate and entire, in form and size, like tea-leaves; flowers solitary, with a small yellowish white corolla, in fine petals, ten filaments the length of the corolla, anthers heart-shaped, and three pistils.

Sowing is commenced in December and January, when the rains begin, which continue until April. The seeds are spread on the surface of the soil in a small nursery or raising ground, called *almaciga*, over which there is generally a thatch roof (*huaschi*.) At the end of about a fort-night they come up; the young plants being continually watered, and protected from the sun by the hausichi. The following year they are transplanted to a soil specially prepared by thorough weeding and breaking up the clods very finely by hand, often in terraces, only affording room for a single row of plan;s, up the sides of the mountains, which are kept up by small stone walls.

At the end of eighteen months the plants yield first harvest, and continue to yield for upwards of forty years. The green leaves called *matu* are deposited in a piece of cloth which picker carries, and are then spread out in the drying-yard, called *matu-concha*, and carefully dried in the sun. The dried leaf is called *coca*. The greatest care is required in the drying; for too much sun causes the leaves to dry up and lose their flavor, while if packed up moist they become fetid. They are generally exposed to the sun in thin layers.

The approximate annual produce of coca in Peru is about 15,000,000 lbs., the average yield being about 800 lbs. an acre. More than 10,000,000 lbs. are produced annually in Bolivia; so that the annual yield of coca throughout South America, including Peru, Bolivia, Ecuador, and Pasto, may be estimated at more than 30,000,000 lbs. At Tacna, the *tambor* of 50 lbs. is worth nine to twelve dollars, the fluctuations in price being caused by the perishable nature of the article, which cannot be kept in stock for any length of time. *The average duration of coca in a sound state, on the coast, is about five months*, after which time it is said to lose flavor, and is rejected by the Indians as worthless.

The smell of the leaf is agreeable and aromatic, and when chewed it gives out a grateful fragrance, accompanied by a slight irritation, which excites the saliva. Its properties are to enable a greater amount of fatigue to be borne with less nourishment, and to prevent the occurance of difficulty of respiration in ascending steep mountain sides. Tea made from the leaves has much the taste of green tea, and if taken at night is much more effectual in keeping people awake. Applied externally, coca moderates the rheumatic pains caused by cold, and cures headaches. When used to excess it is, like everything else, prejudicial to the health, yet, of all the narcotics used by man, coca is the least injurious and the most soothing and invigorating.

Its qualities ought to recommend its use to members of the Alpine Club, and to walking tourists in general, though the deterioration of Coca leaves in transportation, especially in sea voyages, renders the quality of different samples exceeding variable. The alkaloid forms but a small proportion of the mass at best, and in poor samples is very scanty.

Lossen obtained, in the most favorable case, 4 parts per 1,000, and from poor material only 1.6 parts per 1,000.

Cocaine crystallizes in four or six-sided monoclynic prisms. It is soluble at 12° C. in 704 parts of water; easily soluble in alcohol, and still more so in ether. It melts near 92°.

Cocaine combines easily with dilute acids, forming easily cyrstallizable salts, which are soluble in alcohol, but *insoluble in ether*, have a bitter taste, and leave a transient sensation of insensibility upon the tongue.

Hydrochlorate of cocaine, $C_{17}H_{21}NO_4HCI$, separates from its aqueous solution in short transparent, prismatic crystals, which are permanent in the air.

Acetic acid dissolves cocaine readily, but on evaporation the base separates again in crystals. Niemann took these for the acetate.

Nitrate of cocaine crystallizes with great difficulty.

Neutral sulphate of cocaine is a transparent gummy mass, becoming only slowly crystalline.

Schroff, who made the first experiments with cocaine in 1862, observed that it caused fluctuation in the respiration and pulse, and produced mydriasis. Fronmuller (1863) found that it had but little effect in man, in doses of 0.03 to 0.33 Gm. (two-fifths to one-half grain,) and in the case of an attempted suicide, 1.5 gm. (24 grains) did not even produce serious results. The fatal dose, therefore, seems to be much higher, unless the cocaine used in those days was very impure.

According to Merck, coca contains between one-fifth and one-fifty per cent. of cocaine. The average effective dose of the hydrochlorate, in man, is stated to be 0.95 gm. (¾ grain.)

Last year cocaine was recommended as a remedy in cases of great exhaustion from various causes. Its use in such cases suggested itself naturally from the well-known fact that coca has long been used as a preventive of the waste of tissues, fulfilling the same function as tea, coffee, and other substances of this nature. It has also been found of great value in the treatment of morphinism, supplying the craving for stimulants resulting from the gradual or sudden withdrawal of morphine or opium. Dr. Freud has reported very favorable results in morphinism; when morphine is to be slowly withdrawn, the dose is gradually lowered, and that of cocaine proportionately increased. Dr. Freud reports complete recovery in one case after ten days' treatment, and believes that there is a positive antagonism between morphine and cocaine.

It has been often noticed by different experimenters since 1863, that cocaine produces temporary insensibility or numbness when applied to certain mucous membranes, but no practical use suggested itself until quite recently. In the United States it has been used to a considerable extent to lessen the irritability of the soft palate and pharynx in laryngoscopic examinations.

Dr. Koller, of Viena, the discoverer of the anæsthetic effect of the remedy, found that immediately after the instillation of a two per cent. solution of hydrochlorate of cocaine into the eye, there was felt a short feeling of burning lasting for about one-half minute, which was soon followed by an indistinct feeling of dryness. The aperture of the eyelids appears wider, and reflex actions (such as are usual when the cornea is touched: twitching of the head, of the lids, turning aside of the eyeball, etc.,) disappear. When this condition prevails, pressure may be made upon the cornea or a portion of the conjunctiva be caught with pincers, without any disagreeable sensation being felt. The anæsthesia of the eye lasts for about ten minutes, and a low degree of sensibility persists for several hours. Twenty to thirty minutes after the application, the pupil becomes dilated, returning in about twelve hours to its normal condition. The only abnormal symptom observed during this condition is a slight paralysis of accommodation. which can, however, be overcome by a little effort.

Since Dr. Koller publicly exhibited his experiments and prophesied for cocaine a speedy general use in ophthalmological practice (for operations, etc,) the new drug has been experimented with in all countries, the United States included, and those who have used it and seen its operation are quite enthusiastic over it. Moreover, it has already been ascertained that it acts as an anæsthetic not only on the conjunctiva of the eye, but on all mucous membranes.

Prof. W. M. Polk, M. D., of New York, has used a four per cent. solution of cocaine as an anæsthetic in an operation for abscess of the liver, the solution being applied to the open wound; and under its anæsthetic effect the operation was completed within twenty-five minutes without any discomfort to the patient.

On October 29, 1884, Dr. Polk closed rents of the cervix uteri in two cases, after applying the solution of cocaine as given above. Three applications were made two or three minutes apart, and the operation was commenced about three minutes after the last application. The first operation lasted forty minutes, but no complaint was made until the last ten minutes, and then the discomfort was a sense of soreness rather than acute pain. In the second case, there was more sensitiveness to the touch before the application of the solution. No pain was felt, however, until after the lapse of twenty minutes, when it was necessary to re-apply the solution, which was done directly to the cut surfaces, after freeing them from blood.

The testimony of this patient is valuable, as she had previously undergone the same operation with ether, and she unhesitatingly preferred the application of cocaine.

Dr. J. R. Uhler, of Baltimore, writes to the Maryland *Medical Journal*, that the application of the solution of the muriate of cocaine to the vulva mitigates the pains of labor.

Dr. Felix Semon, of London, England, has used it successfully in intra-larnygeal operations.

Dr. C. Bader, of Guys Hospital, has repeatedly used it in operations on the eye.

Dr. E. H. Bosworth reports, in the *Medical Record* (Nov. 15th,) that on applying a solution of cocaine (2 per cent.) to the nasal passages, the venous sinuses below the muccus membrane become, within twenty or thirty seconds so rigidly contracted as to expel all the blood contained in them, and to cause the membrane to cling closely to the bony structure which then becomes sharply outlined. He has used the drug in hypertraphy of the nasal mucous membrane (*nasal catarrh,*) acute *coryza* and in operations for nasal *polypus.* In each case the venous congestion or turgescence was so thoroughly kept down that all discomfort was removed, and in the case of polypi not only the recognition and removal of the growth became quite easy, but also turned out a bloodless operation.

Dr. Bosworth also suggests the use of cocaine in hay-fever.

A four-per-cent solution is now generally preferred when prompt action is required.

We may add that the drug appears to be of value particularly also to dentists. While its effects may be too superficial to render it applicable in cases of extraction, it will undoubtedly add much to the patient's comfort when ligatures are to be forced under the gum in the application of the rubber dam, and it may possibly be of service as an alleviator of sensitive dentine. Its topical application will probably be found in some forms of neuralgia, and in odontalgia. Cases of pulpitis will probably be relieved, on account of its property of relieving venous congestion, as mentioned by Dr. Bosworth (*supra*).

To produce local anæsthesia it is only necessary to paint the part with the solution two or three times at intervals of as many minutes. Insensibility of the part will supervene in about five minutes, and continue from twenty to thirty minutes. It may also be injected hypodermically with good effect. A two or four-per-cent. solution is generally employed, but a stronger one is sometimes required, even as strong as twenty per cent.

If ever a remedy, on purely theoretical grounds, held out any hopes of being serviceable in sea-sickness, it seems to us that cocaine is one of these. At all events, it will be worth while to tr its effects.

We are indebted to the below-named journals for the data for the preceeding article:

American Druggist, Dec. 1884; *The Lancet*, Nov. 22, 1884; *N. Y. Medical Record*. Nov. 15, 1884; *Buffalo Medical and Surgical Journal*, Dec. 1884; *The Dental Advertiser*, Jan. 1885.

ARTICLE IX.

CHEOPLASTY.

BY LAWRENCE VANDERPANT, L. D. S., ETC.

This term, derived from two Greek words, signifying literally, "*to fashion by pouring*," was, some twenty-five years since, applied by Dr. Blandy of Baltimore, to a system of constructing artificial dentures by means of a casting of an alloy of tin by a process very similar to the now well-known rubber process, for which he obtained two or more patents. For several reasons the system did not receive popular favor, perhaps the chief one being the advent of rubber about the same period, and, may be, the inventor claiming too much, and urging a universal adoption of his method to the exclusion of gold and other material. In various forms, at different times, it has been brought to professional notice under the name of "*Adamantine*," *Weston's Metal*, and more recently under the auspices of Drs. Atkinson and Reese by that of "*Cast Gold Alloy*," and undoubtedly these gentlemen have, by the bestowal of care, patience, and scientific application, produced a result far in advance of anything hitherto achieved, and the advocacy of the former, for its therapeutic merits, has rendered it a *sine qua non* to every liberal and advanced practitioner in dental prosthesis.

Although the manipulative process is by far the most simple in Dental Mechanics, yet it is one in which failure and disgust will most frequently occur in early experiment. The writer gave earnest attention to the subject some twenty-three years since, but from repeated failure abandoned it, and it was not until he saw the splended results (to the patient) in the offices of the above-named gentlemen, that he again experimented, with the view of affording the profession a positive, unerring means of producing a cast metal base, resulting in an apparatus designated *The Positive Cheoplastic Fabricator*,* previous to which *The Campbell New Mode Heater* had afforded a most efficient auxiliary, (by making some simple additions,) but it was evident a less costly and more simple apparatus was needed.

Excepting Dr. Reese's method, the only means at hand are different descriptions of flasks, one of which was patented by Dr. Lawrence, of Lowell, Mass, others by Drs. Weston, Moffat and Watts, but as failure is more likely than not to occur by their use, they are unpopular—"*it is as essential to regulate the Heat in Cheoplasty as in Vulcanizing*." Such premise being granted, it will be readily understood that the ordinary Cheoplastic Flask subjected to an uncertain heat, will crack the plaster investment, The metal when poured will probably not be retained, the teeth will be checked, and at the best a misfit is a certainty. By means of the Fabricator a casting can be made into the commonest glass bottle and fracture is impossible (*i. e.*, assuming a suitable alloy be used.) Without the aid of a thermometer temperature is ensured which will evaporate all moisture without danger of cracking model or investments, after the whole is elevated to a degree corresponding to the melting point of the metal employed; after cooling, the work of removal from the flask will necessitate but little labor, time, or skill, to make it fit for the mouth.

The whole process is clean, simple and elegant, a great portion of it intrusted to the least experienced pupil will result satisfactorily; in this respect it most favorably compares with every known system of Prosthesis. It is hoped that the Celluloid craze is totally consigned to a dishonored grave, but though a worthless thing, yet much valuable time and ability was spent in connection therewith, and many a good practice injured thereby; but such as used it did so in the belief that it obviated some of the inherent defects of rubber, a notable one being its non-conductivity. To these, this system is heartily commended. The Cheoplastic system is by no means recommended for universal use, as its value is only "*especial*" in the inferior maxillary—in that respect it has no equal; its weight (which, though, is imperceptible in the mouth of the patient) and a certain property of *vis inertia*, makes a denture remain in its place "*like a corpse in bed*;', a normal thermal condition is maintained, hence inflammation and excoriation is rarely experienced, a much less rapid absorption of the alveolar occurs, and a patient acquires such confidence that mastication is soon achieved. Much more might be said, but your space is limited, and the field has been well covered by Dr. Atkinson and Reese, to whom be all praise and honor.—*The Dental Advertiser.*

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*Patent No. 304, 766; Sept. 9th, 1884.

ARTICLE X.

A NEW METHOD OF PLACING THE OLD-FASHIONED PIVOT CROWN.

BY DR. E. C. REDGELL.

I have quite recently struck upon a plan for setting crowns, which for simplicity, strength, durability and neatness I don't think is excelled by any of the modern methods. I will thus describe it: Consider a root in a healthy state, file or grind it down some distance below the gum, burr or ream out the canal as near the apex of the root as possible, cut the walls around the orifice freely, if the wall of the root is no thicker than paper at the orifice it makes no difference; select a common pivot tooth of size and color to correspond with the natural teeth; measure the depth of the canal and socket in pivot tooth and cut from one of Howe's screw posts a pivot of the required length; dry and fill, about one-fourth full of cement (I prefer Caulk's), and while it is yet quite soft press your pivot with the crown on it home; leaning the crown in any desired position at this time, as this will determine its future position; hold it so for a few minutes, then remove the crown, leaving the post fixed in the cement.

Now fill the remainder of the canal with gold or amalgam flush (I prefer amalgam), and while soft put the crown on the post and give it a few gentle taps; you can make a magnificent fit.

Then fill the socket in the crown half full of cement, put it on the pivot, and press home, holding it for a few minutes, when your work is done.

If you should anticipate future trouble and wish to treat the root through the canal, file the threads off the post that enters the crown before putting it on, then the crown may be very easily removed at any time by taking a pair of forceps and turning it, which will sever it from the cement; with a pair of pliers you can unscrew the post and have access to the root without irritating it or breaking any of your work.

By bending the post, grinding the crown or not, you can give most any of the divergencies necessary for the crown. By this method the root can be entirely covered with the filling; you can take weakest kind of roots and put strong and durable work on them.—*The Dental Advertiser.*

ARTICLE XI.

HAND MORTAR FOR MIXING AMALGAM.

BY D. GENESE, D. D. S.

The repeated expressions of prominent dentists that amalgam is better mixed in the hand, the warmth and plasticity helping the amalgamation, have induced me to offer the profession a Hand Mortar made of fine rubber, without a metal pigment, whereby the conditions most favorable to mixing may be maintained, at the same time preventing the hand from being stained, the absorption of mercury through the thick skin and the perspiration mixed with the metal causing spots. It may be manipulated with a glass pestle, or the finger covered with a rubber stall.

EDITORIAL, ETC.

THE DENTAL SCHOOLS.—The Session of 1884-'85 of the different dental institutions is drawing to a close, and their Commencement exercises will be held during the latter part of the present and the beginning of the coming month. The present session has been, as far as we have been able to learn, a very prosperous one with some of the schools, while others are in a languishing condition, barely receiving enough to meet the running expenses from the tuition fees of the small number of students in attendance. Such a state of affairs is occasioned in a great measure by the manner in which some of these schools are conducted, the sole motive, apparently, being self-interest without regard to that of the science generally; the least possible sacrifice of time and effort being made by their faculties, and students graduated for their fees only. Another reason for such a deplorable condition is the large number of dental schools, many of them being located in places totally inadequate to furnish clinical material, and some of these schools offering as an inducement to secure students. low fees. which, like cheap dental work, are on a par with what is received by the student. We are gratified to be able to state that the Dental Department of the University of Maryland has had a most prosperous session of 1884-'85, and that the qualifications of the candidates for graduation are such as will reflect honor upon any institution. The specimen mechanical work both of metal and plastic materials, and especially the former is now on exhibition in the Dental Building and open to the inspection of all visitors The contest for the prizes offered to the graduating class will be held on the 14th of March, 1885, and be determined by a committee of dentists not connected with the faculty of the University Dental Department. To this contest all practicing dentists are cordially invited, as the operations performed will demonstrate the efficiency of the contestants.

The commencement exercises will be held at the Academy of Music, Baltimore, March 17th, 1885, in connection with the Seventy-ninth annual Commencement exercises of the Medical Department. One of the most gratifying facts connected with the Dental Department of the University of Maryland is, that, so far as we know, no student who has ever attended one course at this institution, has gone elsewhere to graduate.

DENTAL EDUCATION.—After the present session of 1884-'85, five or even more years of dental practice will not be considered equivalent to one session in any of the reputable dental schools of this country. While we cheerfully acquiesce in the regulations adopted by the American Dental Association and the National Board of Dental Examiners, yet we hold to the opinion that five or more years of actual dental practice are, and should be considered a better qualificaiton for a dental student to present himself as a candidate for graduation, after attending one full session of five months in a dental school, than attendance on one course of medical lectures even wtih two years of dental office pupilage.

We also perceive that the Association of Dental Faculties has adopted a graded course for themselves, wherein the first course or junior students are confined to mechanical dentistry for the first session, and not permitted to begin the practice of operative dentistry until the second session. This, we think, is a decidedly backward movement, and one that will be productive of great injury to the cause of dental education. So far from being prevented from taking advantage of all the opportunities afforded by two full sessions in operative dentistry, we contend that the entire time of two sessions of five months each is absolutely necessary to qualify the dental student in this branch of his profession ; and that it wodld be much better to increase instead of to diminish the time for such study, and experience. Such a restricted course ofstudy will, perhaps, answer the purpose of enabling those schools that have a limited supply of clinical material, in the form of infirmary patients, to supply their senior classes to the exclusion of their junior classes and we are inclined to believe that such was the motive that instigated the adoption of such a graded course, or at least its presentation for adoption. It is certainly a great and deplorable mistake to deprive dental students of any advantages which dental schools can afford them, and such action must have the effect of lowering the standard of dental qualification.

BIBLIOGRAPHICAL.

HARRIS' PRINCIPLES AND PRACTICE OF DENTISTRY.—Including Anatomy, Physiology, Pathology, Therapeutics, Dental Surgery and Mechanism. Revised and edited by Ferdinand J. S. Gorgas. A. M., M. D., D. D. S., Author of "Dental Medicine," Editor of "Harris' Dictionary of Medical Terminology and Dental Surgery," Professor of Dental Science, Dental Surgery, etc., University of Maryland. Publishers: . Blakiston, Son, & Co., Philadelphia, 1885, Eleventh Edition. Pages: 994. Illustrations: 740.

The first edition of Chapin A. Harris' "Principles and Practice of Dentistry" was published in 1841, and from that date it has been the principal text-book in all dental schools.

The last or tenth revision was issued under the careful supervision of the late Professor Philip H. Austen, M. D., D. D. S., assisted, in the parts relating to anatomy and physiology, by Dr. Thos. S. Latimer, and in parts relating to pathology and surgery, by the editor of the present edition. As the ten years prior to this revision had nearly revolutionized dental mechanism, Professor Austen found it necessary to almost re-write the portion of the work relating to "Mechanics," and its superior excellence was universally acknowledged.

Nearly fourteen years having elapsed since this was done, the rapid advances made during this period in Dental Histology, Pathology, Surgery, and also, to a considerable degree, in Mechanism, have necessitated another revision, and at the request of the author's family, and of the publishers, the editor has alone undertaken the task of revision, and the present edition is the result of more than a year's labor. This duty has been assumed with the hope that an experience of over a quarter of a century as a teacher in dental schools, and also as a dental practitioner, may have furnished the qualifications for such an undertaking.

The time which has elapsed since the first appearance of the tenth edition has necessitated a greater revision of this work than has been the case with any former edition, and the task of preparing an entirely new work would have been no greater.

Considerable changes have been made in the general arrangement of subjects; a number of entirely new chapters have been added in the consideration of subjects not even alluded to in former editions; additions have also been made to the text of nearly every chapter, some of the latter being far in excess of the original text.

The number of illustrations has been greatly increased, and the new matter now inserted has brought the work fully up to the time of its publication.

Obsolete theories and processes, together with unimportant details, have been omitted, and more useful matter substituted. The aim of the editor has been to meet the demands of the present advanced state of dental science.

The new matter added includes: The Development of the Bones of the Head and Face; Temporo-Maxillary Articulation: Description of Mucous Membrane; The Origin and Development of the Teeth; Analyses of Tooth Structures; Secondary Dentine; Dentition; Calcification and Decalcification of the Teeth; Alveolar Pyorrhœa; Apthous Stomatitis; Thrush; Sanguinary Calculus; Malformed Teeth; Effects of Syphilis upon the Dental Structures; Sensitive Dentine; Theories as to the Cause of Dental Caries; Treatment of Dental Caries; New Methods, Materials and Instruments Employed in Filling Teeth and other Operations; Electric Mouth Lamp; Electric Mallet; Dental Engines and Attachments; Rubber Dam Appliances; Treatment and Appliances for Correcting Irregularity of the Teeth; Contour Fillings; Replantation and Transplantation of Teeth; Different Methods of Inserting Artificial Crowns on Natural Roots; Bridge Work; General & Local Anæsthetic Agents; Improved Forceps; New Materials and Trays for Impressions; Articulators; Blowpipes; Furnaces; Celluloid; New Apparatus for Vulcanizing Rubber and Moulding Celluloid; Repairing Vulcanite; Duplicating Dentures; Theory of Vulcanizing; Regulators; Zylonite; Gold Alloy and other Cast Bases: Temperament in Relation to Natural and Artificial Teeth; Improvements in Porcelain Teeth; New Splints for Fracture of the Jaws; etc.; etc.; etc.

The Eleventh Edition of Harris' "Principles and Practice of Dentistry" is submitted to the profession, with a hope that it will be found a useful elementary treatise, a text-book for the student, and a reliable guide for the dental practitioner.

TRANSACTIONS OF THE ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.—From its organization to the close of the year 1883. This is a valuable record of the proceedings of one of the best dental societies in this country and contains much interesting and important information, embraced in over two hundred pages with a number of illustrations. Copies can be obtained from the secretary Dr. Ambler Tees, 548 N. 17th St., Philadelphia.

DIAGNOSIS AND TREATMENT OF CHRONIC NASAL CATARRH.—By Geo. Morewood Lefferts, A. M. M. D., Professor in New York College of Physicians and Surgeons, etc., etc. Reprinted from *Medical News*, and from American Clinical Lectures. Publishers: Lambert & Co., St. Louis, Mo., 1884. A neat little volume of forty-nine pages, in which the subject is scientifically treated.

VICK'S FLORAL GUIDE, 1885.—Published by James Vick, Rochester, N. Y. This is another of the beautiful Annuals published by one of the most celebrated florists and horticulturists in this country, whose seeds and plants have for many years been presented to the public with the most satisfactory results. The present volume is embellished with a beautiful colored frontispiece representing Asters, besides being profusely illustrated throughout. Valuable information can be obtained by a perusal of its pages.

MONTHLY SUMMARY.

A NOVEL FILLING.—Case under care of A. H. Tester, D. M. D., L. D. S., Eng.—The following incident in practice may be of interest to our readers: N. B., æt. 27, called on me some time since in order to have his mouth examined. On examining his teeth, I found them remarkably good, with the exception of a few crown cavities. In the first lower molar on the right side I found what appeared to be a very good crown amalgam filling. I examined it carefully, and to all appearances it was very compact, the edges being neatly trimmed and smooth. The patient expressed regret at not having paid proper care and attention to his teeth, and said he had not been to a dentist before. I replied that I thought he must have made a mistake, as I could show him one very good filling in his mouth which I considered very well done, and likely to preserve his tooth for some time.

He again assured me I was the first dentist he had ever consulted, and as regards the filling I had found it had occurred in the following manner: Last season on returning from duck shooting, he remembered while dining on the proceeds of his day's sport, to have bitten on a shot; which was forcibly driven into a cavity existing in this tooth, which had been slightly sensitive prior to this.

Finding he could not remove it with a toothpick, he had taken to grinding on it, and as it caused him no pain or trouble had eaten on it ever since. I told him I did not wish to remove it, as it had done such good service, but asked him to take special notice, and let me know from time to time how it was progressing.—*British Journal of Dental Science.*

STRANGLED TO DEATH BY FALSE TEETH.—Capt. Bankhead, of Grafton, W. Va., a well known civil engineer, who had charge of the survey of the Grafton and Greenbrier Railroad extension from Phillipi, was strangled to death at that place Tuesday night by a set of false teeth becoming loose in his mouth. The Captain had been in ill health for some time, and it was under the influence of chloroform, which was given him during the performance of a delicate operation by his physicians, that the accident occurred. He was a Virginian and and about 60 years of age.

MURIATE OF COCAINE.—The Baltimore Surgeons have been using Cocaine extensively in eye and venereal diseases. The reports are very satisfactory. Dr. Michael of the University of Maryland found it very useful in operating upon buboes and cauterizing venereal sores.

TEETH AND BRAIN.—According to Mr. Spence Bate, an English scientific person, the coming race will have no teeth. He alleges that as man advances in development the teeth are gradually evolved into brain matter. This will continue to take place until the time comes when our teeth will be entirely converted into brain, and we shall be compelled either to change our diet or to depend wholly upon false teeth.

It is comforting to know that our brains grow at the expense of our teeth, for we can thereby reconcile ourselves to the prevailing paucity of teeth among Americans. So frail and incapable of prolonged service are American teeth that our dentists have been able to gain the unequaled professional experience that has made them the best dentists in the world. Of course, the meaning of our failure as a teeth-producing people is that we convert them into brain with exceptional rapidity. The more brains a people possesses the fewer teeth they have, and Mr. Spence Bate, were he to examine a thousand American mouths, would unhesitatingly confess that Americans surpass all other nations in the quantity of their brains.

If the coming man finds himself without teeth—as we are told that he inevitably will—it is impossible that he will long adhere to the custom of wearing false teeth. Rather will he frankly acknowledge that he is a toothless animal, and proceed to make the best of his situation. He can, of course, subsist exclusively upon semi-liquid articles of diet; or, in other words, upon what Mr. Logan, with his fondness for Spanish idioms, calls "spoon victuals." There are many animals which thrive upon this sort of diet, and man can undoubtedly add himself to the number. It is more probable, however, that the coming man will consider the disappearance of his teeth as a hint tc him to abandon the clumsy and tedious practice of eating, especially since, by so doing, he can save a great deal of time which he can devote to productive industry.

Why should not the coming man be nourished by hypodermic injections? In this way he could dispense not only with teeth but with his whole stock of digestive organs. Why should a man trouble himself to keep a stomach, a liver, and a number of other eleborate organs, all of which must be kept in repair, or serious consequences will follow? The cost of repairs to the liver alone, in the case of a man living in a malarial region, is a very heavy item, and in many cases it may safely be said that it costs a man more to keep his stomach in operation than the result is worth. If we can be nourished with hypodermic injections—and there is little doubt that before long this will be entirely feasible—wisdom will dictate the abandonment of our digestive organs. These will in a short time become merely rudimentary, or will entirely varnish, and their place in the human body will be occupied by the heart and lungs, which will be so greatly enlarged as to take up the entire space once reserved for other organs.

Thus we see the conversion of teeth into brain will finally result in making man independent of his digestive organs and increasing the size of his heart, his lungs, and his brain. Such a man will be far superior physically to the present style of man. The college student of the future will be able to row twice as fast as at present, and the six-day pedestrians will find it as easy to make twelve hundred miles a week as it now is to make six hundred.—*The Odontographic Journal.*

THE SOUTHERN DENTAL ASSOCIATION.—The 17th Annual Meeting will be held in New Orleans, commencing Tuesday, March 31st, 1885, and continuing four days. In view of the great Exposition being such an attraction for visitors from all parts of the Country, it is confidently expected that this meeting will be the largest ever held, and of unusual interest.

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ARTICLE I.

DENTAL CARIES, AND ITS RELATIONS TO THE GERM THEORY OF DISEASE.

BY G. V. BLACK, M. D., D. D. S.

[Read in the Section on Oral and Dental Surgery of American Medical Association, May, 1884.

Caries of teeth has been defined as a molecular disintegration of the tooth substance; or a breaking down of the chemical constituents of the tooth, molecule by molecule. This destruction always has its beginning on the surface of the tooth, or in some pit, crevice or other imperfection in the enamel. And it spreads from this point, as the focus, in every direction, the dentine being destroyed more rapidly than the enamel; hence it usually happens that the cavity is larger within on the surface of the tooth. Caries does not seem to be a simple solution of the tooth's substance; sometimes we find nearly all of the material removed from the cavity, in other cases we find the dentine reduced to a pulpy or semi-glutinous mass, in which the structure of the dentine is more or less perfectly preserved. Some decays are white, some are black, some have a yellow tinge. All the shades from white to black may be found. But it was not my intention to give a lengthy description of the results of caries; but rather to confine myself as closely as possible to the discussion of the probable cause of the affection. I say probable cause, for I do not assume that the cause, or causes, are certainly known. Indeed, we may say that at the present time there is the greatest disagreement, among even the best informed men, on this important subject; and that it is still very uncertain that any of the theories in regard to the matter are correct, It is proper that I should say, however, that more than one of these explain the phenomena with sufficient accuracy to be of great value, both in the prevention and treatment of this affection. It must not be supposed that a theory must be absolutely correct to be of use. Theories are usually contrived in the effort to explain phenomena, and it often happens that a false theory leads to as good an application of means to ends as the true one would do. Of this, however, we can never have assurance; therefore, as long as there is a reasonable doubt, the 'search for the truth should continue.

The theory for the explanation of caries which has received the greatest attention, and the widest recognition in modern times, is what is known as the acid theory. This theory seems to account for the phenomena more perfectly than any other that has yet attained prominence in the minds of thinking men. As a working theory, a basis upon which to found principles of treatment, it has undoubtedly been the means of much good. Yet, in the scientific aspect of the subject, there is much objection to be urged against it. A very large amount of work has been done with the view of demonstrating the absolute truth of this theory; all of which must be regarded as a failure, so far as the attainment of that particular object is concerned. The labor has not been lost, however, but on the other hand has been of immense value. It is this labor, the basis of fact which it has brought to light; that will be of most service to us in the building up of other theories for the explanation of the phenomena, which may serve us usefully until such time as theories shall be displaced by demonstration; the goal to which we are all looking forward.

According to the chemical theory, the substance of the tooth is decomposed by an acid; this acid acts more readily on dentine than upon the enamel, therefore the tendency to the enlargement of the cavity toward the internal portions of the tooth. Some writers, as Dr. Watt, have attempted to define the acids thus acting, and to divide decays into classes according as this or that acid is active in its production. The acids that have been thus pointed out are, nitric acid (white decay,) sulphuric acid (black decay,) and chlorohydric acid (intermediate colors.)

Most of those who have written on this subject, however, have been content without specifying the particular acids so definitely; while some have been of the opinion that these particular acids have little or nothing to do with the matter, and seek to show that other acids are more likely to do the ugly work.

The views of Dr. Watt have received much commendation in this country, but not so in the old. There, other men have been prominent, and we find that while they have agreed in the main, there are important differences between them. As we have said, Dr. Watt has maintained that decay is caused by the acids—nitric, chlorohydric, and sulphuric, with possible others.

In Europe the influence of these particular acids has been very generally denied, and the results attributed to other acids, as the lactic, acetic and the group known as the organic acids. Among those that have examined this subject, none, perhaps, have attained a wider hearing than Magitot, of Paris. This gentleman published a work on this subject in 1868, in which he makes an extended examination of the subject, arriving at the conclusion that decay is caused by acids. These acids, however are derived from the saliva through the process of ferment action. Dr. Magitot instituted a long series of experiments to determine the effects of the suspected acids on the teeth. This series of experiments shows that most of the organic acids act very feebly on the teeth in the proportion of one to one thousand of water; and that in the proportion of one to one hundred they act quite energetically; so that the teeth submitted to their action will be completely decalcified within a few weeks or months. Most of this series of experiments were continued, however, for two years. The conclusion seems to be that caries may be produced by any of the group of acids that may be developed by the fermention of the saliva. These are the lactic, acetic, butyric, etc.

Dr. Magitot states distinctly that the agency of micro-organisms in the production of these acids is admitted by him; but discusses this phase of the subject no further. He makes no effort to determine to what extent these acids may be formed in the mouth. All of his experiments were tried out of the mouth, and no provision whatever was made to ascertain the effect that fermentation may have had on his solutions in the progress of his experimentation. This being the case, the only result of the experiments is the determination of the strength of the solutions of these different acids, necessary to decalcify a tooth.

This, together with the fact obtained from other sources, showing that most of these acids are the products of certain fermentations that may go on in the mouth, gives much force to Dr. Magitot's couclusion.

Very soon after Dr. Magitot's work, in the same year, indeed, came the work of Lieber and Rottenstein, to which we have referred. The work seems to have been written for the express purpose of showing that decay of the teeth is caused by the life and development of the fungus known as leptothrix buccalis. In this the authors seems to have signally failed. They certainly make but little advance toward the demonstration of the parasitic theory of this affection. Indeed they do not seem to have endeavored to show that this fungus does more than promote decay that has already been established.

They say, after having made an extensive examination of the life and growth of the leptothrix, "From what has been said it results that two principal phenomena manifest themselves in the formation of dental caries, viz., the action of acids, and the rapid development of a parasitic plant, the leptothrix buccalis."

They do not suppose the leptothrix buccalis capable in itself of attacking the teeth, if their condition be normal, but when their surfaces are once softened by acids, then the fungus may penetrate the portions thus softened, and continue the destruction.

Again they say: "It seems that the fungi are not able to penetrate an enamel of normal consistency. The dentine itself, in its normal condition of density, offers great difficulties to their entrance, and we are not yet sure that the leptothrix could triumph over this resistance," Again: "We cannot decide at present if the leptothrix is able to pentrate sound dentine when, from any circumstances, it happens to be denuded." * * * "But if the enamel or dentine are become less resistant at any point, through the action of acids; or if, at the surface of the dentine, a loss of substance has occured, then the elements of the fungus can pass into the interior of the dental tissues, and produce by their extension, especially in the dentine, effects of softening and destruction much more rapid than the action of the acids alone is able to accomplish." * * * "The participation of the fungus is constant in the progress of caries which have reached this stage. As soon as a loss of substance can be shown there is found the presence of the fungus, so that the question whether or not the acids alone could produce ravages more considerable is without importance."

The modus operandi by which leptothrix may produce softening of dentine is left without explanation. We can conceive, however, that they may do something to assist the softening process by the out-pouring of a digestive fluid. If, however, this fungus gave a fluid that would digest a tooth, we would think that sound teeth would be very scarce, for its grows abundantly in every mouth.

Since the time of Lieber and Rottenstein's work we remember of no other of much importance having appeared on this subject. The discussion has continued, however, in the journals. We cannot undertake to review this literature, interesting as it would be; but we must content ourselves with one writer, Dr. Miller, now of Berlin.

Dr. Miller's experiments bear the stamp of being more carefully performed than any that have previously come to our knowledge. This was to have been expected from the fact that they are the latest, giving the experimenter the advantage of all that has gone before, and for the reason that he is very favorably placed for such work, being in the midst of the best experimenters of the world. Therefore his work is looked to with unusual interest.

We need not, however, notice any but his last series of articles, that which is now appearing. We cannot, of course, criticise Dr. M.'s work now, for we have not heard him through; but enough has appeared to show very clearly what the result will be.

Dr. M. begins this series of articles with this sentence: "During the last two years I have stated at different times and places, as the result of many experiments, that "the first stages of dental caries consists in a decalcification of the tissues of the teeth by acids, which are for the greater part generated in the mouth by fermentation. The object of the investigations described in this and the following papers is to determine this ferment, and the conditions essential to its action.' "

We see from this that Dr. Miller begins just where Dr. Magitot left off, sixteen years ago. The discussion of the subject during these years has given us no additional facts as to the essential nature of these phenomena; but the advance of thought in reference to the general subject of such investigations has been such that no man would now repeat M. Magitot's course of experimentation with the same end in view.

I will give you a very brie synopsis of Dr. M.'s course. And while I do so I wish you to keep in mind the object he has in view. It is admitted that decay is brought about by acids, developed, or Dr. M., supposes them to be developed, by fermentation of some kind. The object of this course of experiments is to find and examine this supposed ferment.

Is is not necessary that I should describe in detail all the apparatus with which the experimenter provided himself; it is sufficient to say that all the appliances for the prevention of error were used. The first question to determine was whether or not the ptyaline of the saliva could so change starch as to produce an acid. This question was soon decided in the negative. The starch was promptly changed into sugar, but here the rea-ction ceased; the fluid remained permanently sweet when the proper precautions were observed to prevent the ingress of germs. This proves that the acidifying power does not belong to the saliva. It must, then, be something foreign.

Now, a freshly extracted carious tooth was taken, all food removed, the outer portions of the decayed mass saturated with a 90 per cent, solution of carbolic acid to destroy any accidental germs that might be in this portion. Then, with an instrument, purified by heat after each cut, layer after layer of the softened dentine was removed until the inner portions were reached. Then a slice was quickly conveyed to a sterilized culture medium, composed of sterilized saliva, water, sugar and starch, and placed in an incubator, together with another test tube of the same culture fluid uninfected, to serve as a check. In twenty-four hours the infected culture became acid, while the other did not. This remained constant in a sufficient number of experiments to establish the fact that the acidity was due to the infection.

From the cultures that had become acid, other cultures were infected, which also became acid; thus proving that the experimenter was dealing with a ferment that was capable of propagating itself; an organized ferment.

Microscopic examination showed that these cultures contained an organism similar to those found in the deeper layers of carious dentine, and which remained constant in their characters. Chemical examinations, which seem to have been carefully conducted, showed the acid produced to be lactic acid. This acid has been shown to be capable of decomposing the teeth by M. Magitot, and many others. Yet Dr. Miller goes still further, and by placing sections of dentine in his culture fluids that he has infected, finds that they are decomposed by the acid formed; while such sections placed in such fluids not infected are not changed. Thus he not only proves that an acid is formed, but that the acid is formed in sufficient amount to destroy the dentine.

This, when compared with the best experimentation previously had, marks a great advance. One point seems to have been gained. One organism has been traced thus far, and may now be said to have proven to be able to produce certain of the phenomena of decay. But this is not all. There is much yet to be done. True, one other point is spoken of by Dr. Miller. All who have made a careful study of caries know that there is a peculiar enlargement of the tubules, which is not seen in dentines softened by acids alone. Dr. Miller has been looking for this also, and not without success, for in some sections of dentine exposed to the action of the cultures, he found the organisms crowding into the tubules, and tells us that he also found them enlarged as in natural caries of the teeth in the mouth; indeed that he had before him veritable caries artificially produced.

This delineation of results fo experimentation must have great weight in the settling of the problems at issue, especially if they are confirmed by other competent observers. There is nothing in these experiments that are not in harmony with known facts, unless it be the widening of the tubules by the crowding in of the organisms. It is known by previous experiment that this widening is not caused by the lactic acid as it exists dissolved in the surrounding medium, and I think very few will be willing to concede that the organisms can accomplish this by physical force. This point requires further discoveries. However, I think it may be explained in advance; at least the effort may serve to direct experimentation.

In a previous lecture I have dwelt at some length upon the digestive fluids of living organisms. Unexpectedly I find use for these ideas now, for they were written before I saw Dr. M's last article. I have explained how it is that dead bone, roots of the temporary teeth, ivory driven into the flesh, catgut ligatures, sponge, etc., are dissolved and removed by a soluble ferment. I have also shown that the soluble ferment of the yeast plant has been found and proven. Also that of ammoniacal fermentation; and how plants take up otherwise insoluble substances. Now, this widening of the tubules is a conceded fact. It is also shown that it is not done by the lactic acid in case of other experiments, nor can it be done by the lactic acid in case of other experiments, nor can it be done by the physical force of the organisms. but it can, in all probability, be done by the digestive fluid of the organism. The conditions for this work of the digestive fluid are the same as that of the granulations in widening the meshes of the sponge and finally removing the last of it. As yet no soluble ferment has been demonstrated in connection with this organism; but theoretically it must exist, and if Dr. Miller should undertake to search for it, he will be able to demonstrate it speedily, and its co-operation in producing some of the phenomena of decay; at least determine its capabilities. This organism cannot be said to have been definitely and completely studied until this soluble ferment, or diastase, be found, isolated, and its capabilities separately determined. (Since the above was written Dr. Miller has reported the finding of this soluble ferment.)

It is by no means probable that this is the only organism that may stand in a causative relation to caries.

(Since the above was written, Dr. Miller has also reported the finding of another micro-organism that he thinks capable of producing caries.)

The organism of butyric fermentation, possibly that of acetic fermentation, and a large number of others of the acid fermentations, may cause decay; nor is it by any means a settled fact that decay of the teeth may not be brought about by other vital processes than the acid fermentations. Of this, however, we will speak later.

Another question may arise in this matter and need explanation. I have repeatedly said that the waste products of an organism prevented the activity of that organism when collected in a certain amount. How then can this organism continue to thrive in its own waste product, and thus continuously promote caries, by furnishing more, and still more, of this waste product? Simple enough. Every chemist who has studied lastic fermentation has been in the habit of introducing some form of lime into the fermenting fluid to "flix" the lactic acid in the form of a lactate of lime, in which case it does not hinder the progress of the fermentation. In this way a much larger amount of the lactic acid may be obtained, as it is readily regained from its salts. This was learned long before this organism was found. Now, in the production of caries, the tooth presents the lime for the formation of the lactate, and thus furnishes the very conditions necessary to the continuous growth of the organism.

I wish now to turn your attention for a moment to another class of phenomena, and make some inquiry into their possible participation in the production of caries. I have already spoken of the strong probability that the otherwise normal tissues, when under the influence of certain qualities of inflammation, emit a fluid of acrid and very irritating properties. About the neck and other parts of children we sometimes see this fluid exoriating the skin wherever it touches it, seemingly acting the part of a caustic. I have already referred to the fact that dead bone, ivory driven into the flesh, sponge, catgut ligatures, etc., are dissolved and removed. This causes us to inquire whether or not a substance may be elaborated in the same manner in the mouth, that may have its quota of effect in the production of the phenomena of caries.

I was thoroughly convinced that this was the case years ago, though I endeavored to explain the results by the assumption that an acid is formed. This is entirely unnecessary. Soluble ferments do not seem to depend for their action on either acidity or alkalinity. They seem to be controlled by some other than the known chemical laws, and their action is not yet understood. We have no means of explaining them. If a piece of ivory thrust into the flesh is attacked and burrowed out in holes by a secretion thrown out by virtue of the irritation induced, as asserted by Krause, Kolliker, and other of the most capable observers of the world, why may not a tooth be attacked in the same way by virtue of an irritation of the tissues about its neck, or during the irritation consequent upon its eruption when this is usually prolonged? As a matter of fact, it has been observed that decays are prone to occur in just such situations as tend to confirm this hypothesis.

Thirteen years ago we drew attention to this, in a paper before the Illinois State Dental Society. Both before and since that time I have given much attention to this point, and I am more than ever convinced that it has much to do with the beginning of decay. I do not wish to be misunderstood in this matter. It is not my notion that decays are initiated by this cause alone. It is only one of the first steps by which other forces which come later are rendered operative—a means, if you please by which the surface of the tooth is first broken, and by which organisms are permitted to find lodgment; not means by which decay is carried on, to the complete destruction of the tooth. This effect cannot be produced except while the tissues are in contcat, or in very close proximity to the part in the process of solution, for the reason that the secretion from the tissues would be dissipated in the fluids of the mouth before they could have time to produce their effects upon the tooth structure.

The disposition at which these results are seen are: Wisdom teeth that come through very slowly, on the buccal surfaces of the molars generally, and sometimes on the labial surfaces of the upper incisors. In case of the wisdom teeth, the fact that they are very often decayed before they are fully through the gum is especially remarked; and as a rule, if these decays are carefully noted at a very early period of their progress, it will be seen that they are different from other decays in several respects. It always has its beginning under the free margin of the gum. There is usually no change whatever in the appearance of the tooth; the eye discovers nothing. The surface seems normal, or at most the portion of the tooth appears rather whitish; but on trial with the excavator the instrument will apparently break in through the enamel prisms, disclosing a cavity of very slight depth. It often happens that the enamel may be easily scraped away over a considerable space, as though it was so much chalk. The depth will present much variation; often it is only a part of the thickness of the enamel; at other times we may find it extendng into the dentine, in which it forms a veritable cavity If there is much depth, however, the characteristics will have assumed the more usual type.

Occasionally we see this character of decay (if it may be so called) in the grinding surfaces of the wisdom teeth; occasionally in the first molar, also, where the tooth has come through very slowly, and the gum has been for a long time in a state of chronic irritation.

It is characteristic of this effect that it is often seen on the smooth surfaces of the teeth as in the pits and grooves. No imperfection is necessary to prepare the way for this manifestation.

As I have said this takes place under the gum; is covered by the gum Now, as the tooth rises higher and the surface thus affected becomes exposed, these spots are prone to become the seat of true caries with all of its usual manifestations. However, very often caries does not take place. In this case, a whitish spot is seen, which gradually assumes a yellowish tinge, then brownish, and then finally becomes black. This result is brought about by the settling into, or the formation in, the affected tissue of the black sulphurets; as I was the first to show. (See report on dental chemistry, by Dr. H. A. Smith, Transactions of the American Dental Association, 1874, page 78.)

We see these spots every day upon the molars in every stage of coloration, from ashy white to a deep black. They are as apt to be on the otherwise smooth surfaces, as in the pits and grooves. They may occur on any of the teeth, but are oftenest seen in the positions named. The decays that so often occur on the labial surfaces of the upper incisors are, often though not uniformly, of the same character.

Those decays that occur just at the junction of the enamel and cementum, in persons of middle age or past, occasionally in younger persons, seem, in very many cases, to be of the same character. Some irritation of the gum at the immediate spot seems to be one condition of their beginning. These also have some special characteristics not common to other decays. If they are closely examined very easily in their inception, it will be found that the cementum has been removed, and that the margin of the enamel has become chalky; soon after this, if the case continue to progress, the gum, which till now was closely applied to the part, becomes everted so as to expose the breach in the tooth. This often becomes the seat of the most exquisite sensitiveness just at the present stage of the process, which calls the attention of the patient to the spot. Generally, however, nothing can be seen by either patient or operator, except a slight eversion of the gum, and the slight grooved appearance of the neck of the tooth, which the operator is often puzzled to differentiate from the normal form of the tooth. However, if he will carefully press the gum away (and he will find this abnormally sensitive) until he can see the root of the tooth below plainly, it will be easy to demonstrate that there has been a decided loss of substance. Trial with an instrument will develop the fact that the surface within this groove is exceedingly sensitive; the dentine is exposed. Now if the case is left to itself, this sensitiveness will continue some weeks, or even months, and then abate: and it will be found that the case has taken on the usual charatcer of decay. It may cease to progress and assume a dark color, or it may progress rapidly, and remain of a more or less ashy cast.

It has been our opinion that this class of decays, if that term can be applied at this stage, is brought about in precisely the same way that the root of a permanent tooth is partially absorbed on account of a chronic irritation of its peridental membrane. In other words, a soluble ferment has been called out by the irritation, that has dissolved out a part of the tissue at that point. Or, if you prefer to have it put in that way, a true absorption has taken place which forms the nidus for the future decay.

Another class of decays are very common which I have studied very closely, and which seem to be of the same character in their inception. These begin under the free margin of the gum under plates that abut closely against the teeth. These are usually very rapid in their course, evidently for the reason that as soon as the free margin of the gum is everted, a pocket is formed by aid of the plate, in which fermentation can proceed to the very best advantage. It does not seem that the beginning of this decay is often after the eversion of the gum has uncovered the spot. Of course, we often see decays occur where clasps encircle the teeth high up on the crown. Such must not be confounded with those that begin at the margin of the cementum.

DISCUSSION ON DR. BLACK'S PAPER.

Dr. Marshall.—In Dr. Miller's experiments on dental caries, whether produced in the mouth or artificially in his culture fluids, he invariably found an enlargement of the dental tubuli, to the extent of the penetration of the affection, and that the tubuli were filled with micro-organisms.

Dr. Boedcker, of New York, found the same enlargement of the tubuli, cut minus the micro-organisms, in his experiments with regard to the action of arsenious acid upon healthy dental tissue.

Dr. Black refers the cause of the enlargement in Dr. Miller's experiments under both conditions, to the action of a soluble ferment produced as a waste product by the *bacterium lactis*, and which dissolves or digests the organic portion of the tubuli, and the inorganic material surrounding it, while Dr. Boedcker refers the condition found in his experiments to inflammatory action resulting in absorption caused by the irritation of the arsenious acid.

I would like to ask Dr. Black whether he considers the conditions found by these gentlemen to be identical?

Dr. Black.—I will first say that I do not regard the results as caused in both instances by the *bacteriumu lactis*, but in both cases the results are brought about, in all probability, by a digestive body. The action in both cases is the same kind, the philosophy of the widening is the same in both instances, the different forms of life. In the case of Dr. Boedecker's experiments, the conditions described could only be due to the formation by the irritated dentinal fibrils of a menstruum which digests and removes the tubular wall.

In Dr. Miller's experiments, the bacteria form a menstruum which digests and removes the walls of the tubuli.

In the case of the *bacterium lactis*, a digestive body, or diastase, has now been demonstrated by Dr. Miller, the organism is fully proven to be able to perform the act of digestion, and we know that the tissues of the higher animals have the power of removing parts by what is usually called absorption, and which is a form of digestion.

It has been well shown that the pulp chamber may be enlarged in this way in cases of long-continued irritation of the pulp. Bone is also easily renoven under pressure, evidently by a similar vital process—a process of digestion by means of a digestive body.

Dr. Allport.—Dr. Boedecker's experiments with arsenic upon dentinal tissue (though not yet fully completed) were upon living tissue, and evidently prove that there was inflammatory set up in the tubules, causing absorption of material. Dr. Miiler's experiments were upon dead tissue (teeth out of the mouth,) and the action seems to have been a chemical one. In the first, the process was a vital one, and may be in kind like that manifested in the absorption of the roots of deciduous teeth, the removed material being largely taken into the general circulation, which may have been "re-molecularized" and converted into new tissue, or carried off as a waste product. While, in the other case, the action was entirely from without, and would seem to have been from acids, and independent of visal processes within the tissues. I can imagine how micro-orginisms may produce a sufficiently exalted irritation of the dentinal fibres to cause absorption of material similar to that produced by the irrition of arsenic in the experiments of Dr. Boedecker.

But in either of these conditions I should expect the changed material would be largely carried off in the general circulation, the same as it is in the enlargement of the pulp cavity consequent upon continued irritation of the pulp, as suggested by Dr. Black, or the absorption of the roots of the deciduous teeth; in both cases the organic and inorganic materials are removed entire, while in caries occuring in the mouth the inorganic material only is largely removed, the organic portion remaining behind to die, be decomposed and washed away, or pass off in gases.

In the experiments of Dr. Miller the conditions are entirely external, and a purely chemical action, resulting in a single change of the elements, and their removal consequent upon the affinity of lime for acids. Whether the fungi excrete an acid or not (and more than likely they do) is of no material consequence so long as the acid is found there; it is the affinity of lime for acids, no matter how produced, whether from a decomposition of foreigh matter, or excreted by the fungi, that to my mind, produces the changed condition in the devitalized dentine

I have, of course, been interested in the arguments of Drs. Black and Miller. They are highly interesting, and there is little doubt that we are approaching a correct solution of this vexed question ; but it will be well for us to pause before we pronounce too confidently that either of these gentlemen account for all the phenomena of dental caries.

Dr. Williams.— May not the enlargement of tubules be caused by the physical force of the micro organisms exerted upon the walls of the tubules? In the vegetable kingdom such instances are not of rare occurence; rocks have been split, and large masses of solid material moved by the continued pressure of fungous growths.

Dr. Fridericks.—Milles and Underwood first called attention to the enlargement of the dentinal tubuli, and they presented microscopical specimens to substantiate their views. Dr. Boedecker's experiments do not prove anything. I would not put much reliance upon the observations of two experimenters. I think we are begging the question.

Some observers can see whatever they desire to see, and later their observations are proved to be worthless. May not the enlarged appearance of the tubuli be due to the methods used in preparing the slides?

Dr. Allport.—I would suggest that Dr. I. L. Susserott, of Chambersburg, Pa.. be invited to speak upon this subject.

Dr. Susserott.—I am very much pleased with the paper just read by Dr. Black, it proves the truth of the lines by Butler, that

> "**Large fleas have little fleas.**
> **And these have fleas to bite 'em;**
> **And there are fleas to feed on these,**
> **And so *ad infinitum*.**"

Various remedies have been introduced for the antiseptic treatment of surgical diseases, the most potent of which is bichloride of mercury. As used in general surgery, a solution of 1 to 1,000 is perfectly harmless, and I do not see why it might not be used with safety and success in the treatment of dental caries.

Dr. Harlan.—The bacillus anthrax and the bacillus tuberculosis can live in absolute alcohol, and also in a five per cent. solution of chloride of zinc.

In order to know how to destroy micro-organisms, we must study the individual organism and apply the special agent which will destroy its vitality.

Eugenol—in the strength of 1 in 75,000, will destroy bacteria, and a weak solution will prevent the development of the spores.

Dr. Black.—I quoted an expression of Dr. Miller's saying it was unfortunate, viz.: "The first stages of dental caries consists in a decalcification of the tissnes of the teeth by acids, which are for the greater part generated in the mouth by fermentation." This is the same question discussed of old, of who led the pig to market, the man or the string. The string is the means used by the man, and the acid can no more cause decay, or even exist in that position, without the organisms, than the string can exist and lead the pig without the man.

The micro-organisms that produce caries must have free oxygen. Therefore, if you plug a tooth perfectly over a little softened dentine you exclude the free oxygon and destroy the organisms. Is is possible, of course, that an organism not requiring free oxygen might produce caries, but all the evidence we have against that supposition.

Dr. Friedrichs.—It seems to me that we are still begging the question. What is the need of antiseptic treatment of caries if micro-organisms cannot exist without free oxygen? When a cavity of decay is hermetically sealed no oxygen can enter, and consequently micro-organisms cannot develop.

Dr. Marshall.—It has been proved by Pasteur that there are certain forms of micro-organisms that exist without free oxygen, in fact cannot develop in that medium; and it is not at all improbable that such micro-organisms may exist as factors in the cause of secondary caries.

Dr. Black closed the discussion by saying: We must come to the point of finding specific micro-organisms. A poison for one form is not necessarily a poison for another. Only about 17 per cent. of alcohol can be produced by the yeast plant, because the excretory product of the plant—alcohol—in that degree of concentration becomes a poison to the plant and prevents further growth. This same alcohol, however is the natural food of the mycoderma aceti. This plant produces acetic acid, which in turn will stop the growth of its plant at a certain degree of concentration. This will now become the food of other organisms. So it is, that that which is poisonous to the one is not necessarily poisonous to another. Certain diseases occur in the child that do not occur in the adult. We believe some of these diseases are produced by micro-organisms. There is some difference in the nature of the tissues or fluids in the two cases that renders the adult unfavorable soil for the growth of these organisms. This gives some hope that in the continuous round of research some means may be found of antagonizing micro-organisms without a resort to poisons, as is now done. These will certainly be different for different organisms.

On motion it was agreed that owing to the lateness of the hour the reading of the paper by Dr. Harlan be deferred, and that it be the first order of business at the session to-morrow.

The section then adjourned.—*Jour. of Am. Med. Asso.*

ARTICLE II.

IRREGULARITIES OF THE TEETH.

BY DR. NORMAN KINGSLEY.

Read before the Odonto-Chirurgical Society of Scotland.

With advancing civilization there is an apparent increase of deformities of the dental arch.

In the higher social scale it is exceptional to find a young person with a perfectly developed and regular row of teeth, set in a well-formed and rounded arch. More commonly, departures from this type will be found of every grade, more or less pronounced, exhibiting some of the phases of narrowed jaws, or teeth protruding, over-lapping, or crowded in every conceivable mal-arrangement. In many instances the cause has some direct connection with other evils that seem inseparable from a state of high civilization.

A close observer for a generation will have seen a multitude of cases which had no apparent local cause, were not of an inherited origin, and could only be attributable to constitutional conditions developing in the individual.

As a general statement, the finer the nervous organization, the more precocious or brilliant the intellect, the greater will be the tendency to mental deformity. The converse is true of feeble-minded people, who, having a fair physique, will show well-rounded jaws and regular dental arches. The exceptions to the latter statement are found among those cases of hopeless idiocy where the whole organization, as well as the intellect, is depraved.

Many peculiarities are of an inherited origin, so far as the individual is concerned; but what caused the initial departure from a normal type in preceeding generations would be impossible to determine. More readily, perhaps, than any other deformities of the human organization are dental irregularities transmissible, and departures from a normal type in the parents re-appear in the children in an aggravated form.

Irregularities that require treatment never appear in the deciduous teeth. The deciduous dental arch is always well-formed and symmetrical. It is only in the second set that deformities make their appearance, and it is exceptional that such peculiarities can be foreseen and prevented. It cannot be determined with any certainty before eruption that a dental arch is going to be abnormal, the causes being generally hidden and remote.

The normal type of the dental arch describes a regular line. The arch may be wider or narrower, varrying somewhat in individuals or races, but the line will be an easy, graceful curve, without break or tendency to form an angle. Within certain limits, a narrow dental arch, as associated with certain features, may become the perfection of beauty; while, with another form of head and face, the widest development may be equally pleasing.

That which is recognized now as the standard or full measure of beauty, as well as utility, is not unlike that which existed in the remotest historic ages, nor different from that which is now exhibited among all communities not degenerated by luxury or vice.

Abnormalties include such a shape of the arch as is not in harmony with the surrounding features; all crowding and twisting of the teeth; and all departures from a regular line in their positions. One form of irregularity seems to be due to unwise or premature extraction of the deciduous canines of the upper jaw. In the ordinary course of nature, these teeth should be the last to drop out. If extracted long anterior to their period of shedding, the permanent bicuspids are liable to encroach upon the domain of the canines, and thus deprive them of their place in the arch.. Such a mal-position can be foreseen and prevented.

Another abnormalty of the superior dental arch which can be prevented, is the result of thumb-sucking, or its equivalent, in the earlier years of childhood. The effect of such a habit is to protrude all the teeth in the front part of the mouth. This deformity will not show itself until the eruption of the permanent teeth, sometimes even after the practice which caused it may have ceased. In one instance which came under the author's observation, a mother of good social position had nursed from her breast a daughter until she was nine years old, the result being that the six upper front teeth were protruding so that the lips could not be closed. But a large proportion of dental irregularities cannot be predetermined with certainty even where there is an hereditary tendency, and can be corrected only when they develop.

An observer with limited experience may often be misled by the appearance of teeth as they first erupt. They may seem to be growing out of the line of the arch, and that a permanent irregularity is inevitable; but many such cases need no interference. If left to themselves, they will approach regularity, and often assume their true position, unless the occlusion of the antagonizing teeth prevents them. But interferance is demanded as soon after eruption as it becomes certain that a deformity is inevitable. There is then no longer justification for delay; for after that period every year increases the difficulties, both pathological and mechanical, and prejudices the stability of the dental apparatus.

But all irregularities in the position of the teeth are not deformities which demand treatment; there are many departures from the normal type where neither the utility nor the beauty of these organs, nor the symmetry of surrouning features, is seriously affected by such mal-position.

The regulation of teeth involves often the wearing of fixtures which cannot be removed and cleansed as frequently as the health of the mouth demands. Their continued presence may provoke caries of the teeth, and a prolonged treatment may seriously impair a nervous system; therefore regulating teeth should not be undertaken without due consideration. Such a consideration must recognize the age sex, and family type, and the relation of the features; the cause of displacement, the constitution of the teeth, and the ravages of decay; the efficiency of the mastication apparatus, the enunciation of the voice, the risk of inflammation, and the destruction of pulps; the systemic condition and endurance of the patient; the time required, and the annoyance to which he would be subjected; and the means and appliances for correction; and finally, the character and permanency of the changes wrought.

Regulating teeth may be undertaken under favorable circumstances at any age short of maturity; but, all things considered, the most desirable period to begin the correction of an extended irregularity is when the cuspidate and second molars are fully erupted. The occlusion of the teeth is an important factor in determining the permanency of the change. All attempts at correction at any age will be folly, unless the antagonizing teeth upon occlusion will serve to hold them in their new positions.

Success in treatment is based upon the fact that the teeth are placed upon the maxillæ, surrounded by vascular, eclastic, bony processes, which are easily moved or absorbed under pressure, and that reproduction of bone will follow such conditions, and make the teeth solid in their new locations. The possibilities under favorable conditions, within certain limits, are almost unbounded. Narrow jaws may be widened, protruding jaws made to recede, individual teeth moved considerable distances,' and teeth elongated or shortened, or twisted in their sockets. The success of skillful efforts in this direction has been triumphant.

Some of the most marked cases have been where the face has been deformed by a protruding or receding jaw, either upper or lower. Strictly speaking, when this occurs with the upper jaw, it is not the maxilla which is at fault, but rather the whole dental arch. Such a condition in the lower jaw is more likely to arise from a mal-articulation at the joint; but in either case, when taken at the proper age, they are quite emenable to treatment.

It is possible, in correcting deformities or irregularities of the dental arch, to create a deformity of the external features. It is not always advisable to attempt to alter the form and expression of a mouth where the condition is an inherited peculiarity—being a part of the family type—and where the change would involve prolonged effort, possible breaking up of a good articulation of masticating organs, and with the knowledge that nature will be constantly making an effort to return to the inherited type. In hereditary cases of extensive character which have been delayed until at or near maturity, we can never feel certain but that the original tendency to mal-position, so long unbroken, will re-assert itself at any time we abandon retaining fixtures.

Upon general principles, it is desirable to retain every sound tooth in the mouth, yet there are many cases of crowded dentition where the removal of a tooth upon each side of the jaw is justifiable. The retention of every tooth in the mouth is not necessary to the efficiency of the masticating apparatus, is not required to maintain the contour of the jaws, and the loss of certain teeth produces no visible external effect. The articulation of masticating organs is of more importance than their number, and a limited number of grinding teeth fitting closely upon occlusion will be of greater benefit to the individual than a mouthful of teeth with the articulation disturbed.

In the abnormality arising from the mixing of inharmonious types, as the small jaw of one parent with the large teeth of the other—resulting in a crowded condition—it is very doubtful if the arch can be made regular without the extraction of some of the teeth. It requires a judgment founded upon long experience to decide always upon the wisdom of extraction, and when such conviction is reached, one may be equally at a loss as to the choice of the teeth to be removed. It is a disputed point which of the teeth behind the canines can be best spared from the mouth. There are so many considerations to be taken into account that it is hardly possible to lay down any rule of universal application. If the sixth year molars are badly decayed, their removal would be indicated. If they were sound, and also the bicuspids, there might be no greater reason for their removal than either of the bicuspids. In fact, sound molars in the jaw are of more value as masticating organs than equally sound bicuspids.

As a rule, extraction of any teeth from a pinched or V-shaped jaw before it is widened, would be likely to prove bad practice. Certainly, the extraction of any teeth from the sides of the jaw in such cases for the purpose of correcting or improving the condition, without immediate subsequent steps being instituted to widen the arch, would be most unscientific and detrimental. Cases are not uncommon which show that a pair of any of the teeth in the mouth may be removed to correct an irregularity, excepting the canines of both jaws, and the superior central incisors. It would be an inconceivable case which would justify the extraction of the superior central incisors; but the upper lateral incisors, and any pair of the lower incisors, may be removed in certain cases without serious detriment to the appearance of the mouth.

The most frequent exhibition of irregularity in the lower jaws is confined to the incisors and canines. The canines are too prominent, and the incisors are crowded and lapping. Most of such cases cannot be corrected by enlarging the arch; the overlapping of the superior incisors forbids. The remedy is comparatively simple. The extraction of one of the centrals is innicated. This will give the required room, and enable the canines to be drawn in; and at the same time the space made by extraction is closed. No matter what the mal-arrangement of the incisors may be, it is almost always better to extract one of the centrals to correct it. When the irregularity is corrected, the extracted tooth will never be missed.

The treatment of irregularities is almost entirely mechanical. To the anatomical, physiological, and pathological knowledge required of the operator, there must be added a knowledge of mechanism and an ingenuity to apply it. Levers, pulleys, inclined planes, wedges and elastics, singly and in combination, are required for this purpose. It is quite impossible for one to overcome a complicated case of irregularity who has not a comprehension of each and all of these instrumentalities.

So far as pressure itself is concerned, it is immaterial from whence is is derived. The same weight, force, or power will produce the same result. It is only a matter of convenience what source shall be employed. For widening a narrowed arch, a jack screw is the most effective means, and can be used to spread one tooth only, or all the teeth on both sides, according as it is applied. Wedges driven between the teeth will enlarge the arch. Levers with elastics are used to twist teeth in their sockets, and an inclined plane can be made to move teeth laterally.

The application of such apparatus to the movement of teeth is one of the most responsible duties the dentist is called upon to perform. Each and every one of these mechanical powers can be made to do his bidding, and equally each one of these may become a formidable engine of disaster. When applied in the mouth, they should have constant watchfulness and care. Not one of them but, in the hands of empires, would cause the destruction of those valuable organs they can be made to conserve.—*London Dental Record.*

ARTICAL III.

AGAIN A SALE OF AMERICAN DIPLOMAS IN EUROPE.

The following editorial article appears in the edition of the *Deutsche Medizinal Zeitung* (one of the best, if at presnt not the best German medical journal) of December 22, 1884. As it can only be of advantage to the medical and dental profession of our country to make the swindle as widely known as possible, and to denounce it in public journals, we bring the following, a *verbatim* translation of the article in question, whereby we cannot conceal that affairs of this kind by no means contribute to our reputation in Europe.

"*Swindle—Doctor—Diplomas.* The *German Monthly Journal for Dentistry*, 1884, publishes the following interesting communication of Dr. Adolph Petermann, in Frankfort-on-Main:

The *Frankfort Daily* brought in its advertising columns the following announcement:

"Doctor-diplomas of Dentistry, Philosophy, Jurisprudence, etc., are reliably and discreetly procured. Address, C. R. (care of Stationer,) 10 Duke street, Bloomsbury, London, W. C."

An inquiry under a fictitious name was responded to from London by two letters from a "Professor" G. Rummler. The first letter is not worth publishing, containing but a general offer and assuring discretion. The second letter was as follows:

LONDON, 32 THORNHILL CRESCENT,
BARNSBURY, March 10, 1884.

Dear Sir: In answer to your favor, I respectfully inform you that you have to deal with an honest man, who will procure you the diploma only from a reliable institute, is: "Wisconsin Dental Academy."

You may deposit the fee with any banking firm in Frankfort, and have the deposit certified to by the firm and communicated to me, whereupon I shall at once order the diploma for you. If you do not wish to confide in a banking house of your city, it will be best if you will send to me 200 marks (about $70) at once, and the remaining $70 on receipt of the diploma. Any other expenses besides the $140 you have not. Please inform me, when ordering the document, of all your Christian names.

Further, I beg you to sign the enclosed printed application for graduation at the place where you read the word, "signed." All the rest I shall fill out. You will see at the back of the blank the attest of the President of the Academy that the degree is only conferred, if recommended *by me*. It will take about five weeks ere I can deliver the diploma to you.

Awaiting your reply and the return of the application signed, I am, etc., etc.,

PROF. DR. G. RUMMLER.

The words on the back were *written* as follows:

"DELAVEN, WIS., U. S. A."

"This statement will be honored from any practicing dentist if endorsed by Prof. Dr. Rummler.

GEO. MORRISON, *President*."

The "honest man," "Professor Dr." Rummler, therefore, procures anybody (also under a fictitious name,) without trouble, for a payment of $140, and *without any scientific attainments or examination*, a doctor-diploma from a chartered Wisconsin Dental College! Nice state of affairs!

From a former article of mine on the same subject, it will be seen that Mr. Morrison delivers even for $12 such a diploma, while here $140 are demanded. Indeed, Mr. Rummler is engaged in a dirty, but profitable business.

Amongst the advertisements of the *Kladderadatch* is the following:

"Doctor Diplomas of Dentistry. Their legality officially attested. Discreet and reliable. B. Walden, 41 Princes Square, Kensington Park, London, S. E."

On inquiry at the above address, one receives the reply from Berlin from Dr. Olschowsky, 100 Linden Street. Mr. O. is gladly willing to procure the doctor-diploma from an American university, respectively a dental college, whose sole representative he is. After he has mentioned that the institute is legally entitled to confer "honorary doctor titles," he continues, *verbatim*, as follows: "You are permitted, therefore, to call yourself a doctor here, if you only add to it; 'Conferred in a foreign country.' or, 'not conferred here.' You may see in every Berlin newspaper, especially the *Tageblatt*, that they dailly contain many advertisements of this kind, with these words added: "To procure you the diploma in I need for the beginning only a short curriculum of your life, and I shall then take care of the rest and send you the diploma all filled out, so that you need neither interrupt your daily occupation, nor do anything whatever."

Finally, O. informs the applicant tnat the whole expenses amount to $200, and that pre-payment is not needed, only the deposit of the sum with a reliable business firm, but best with W. Marzillier & Co., Berlin, S. W., 25 Morkern Str.

On further inquiry, Dr. Olschowsky answers, that all these things "must pass throagh his hands, as the college does never correspond directly with anybody else," and "that the college in question was situated in Delaven." In a third letter the application for promotion arrived, in a fourth Dr. O. advises quickly to conclude the affair, and in the fifth letter Dr. O. tries to quiet any fears of the questioner, in so far as he tells him that Prof. Morrison, the President of the Wisconsin Dental College, comprehends by practicing dentist only dental technic, and that dental surgeon meant something else. Dr. O. concludes *verbatim*. "It says, therefore, in the diplomas which I shall obtain for you, not Doctor of Dentistry, but Doctor of Dental Surgery. Besides I have already procured this diploma for applicants, of whom the gentlemen across the ocean knew that they were not dentists, and it is therefore the same with you. I hope to have removed your scruples, and expect immediate conclusion of the affair, which opportunity I use to inform you that $100 will meanwhile suffice."

Dr. Olschowsky, who has already formerely been active in the distribution of Buchanan's (the so-called Philadelphia) diplomas, now endeavors, therefore, to sell the totally valueless honorary doctor-diploma of the *Wisconsin Dental College, in Delavan, Wisconsin, U. S. A.*, at the price of $200, while the same bogus diplomas are procured through Prof. Dr. Rummler, in London, for $140, and from the Wisconsin Dental College itself for $12. I have sent the letters of Dr. Olschowsky to the Imperial Secretary of the Interior (of Germany,) and thus we may hope that from there this dirty trade may be suppressed.

This barter and sale of American diplomas in Europe ought to be thoroughly exterminated at its source, *i. e.*, in our country; and it would be desirable that all legislatures, or Congress, should pass the most stringent laws, not only declaring the charter of such swindling institutions null and void, but also punishing with penitentiary at solitary confinement and hard labor, for a long period of years, any violation of the law. Of late years our profession has striven most earnestly and successfully to occupy the same rank with its European confreres. American dentistry is recognized all over the world as far ahead of that of other countries; but if American physicians and dentists permit the existence of such swindling institutions, and the sale of bogus diplomas to continue under their very noses, then they must not feel offended if they, on visiting Europe, are looked upon with suspicion, if no special credentials convince their professional brethren across the water that they (the American physicians and dentists) really are graduates of a respectable college.

It is scarcely possible that there can be many such diploma-manufactories, and the few that still vegetate ought to be easily eradicated.

ARTICLE IV

THE STANDARD OF WORK ON THE NATURAL TEETH THAT THE DENTIST OF THE FUTURE MUST BE EQUAL TO.

BY E. PARMLY BROWN, D. D. S., FLUSHING, N. Y.

The highest type of tooth preparation for gold building on decayed teeth is that which removes the most of the damaged tooth material, and cuts into and takes away the least of the uninjured structure, all other things being equal.

The most durable gold filling, applied to this ideal cavity, is that which is most dense up to a certain requirement, from the beginning of the retaining pits to the final finished surface. Density, combined with cohesion in its most perfect state, is requisite at each under-cut, retaining pit or dovetail, to retain the filling in position, and to enable the operation to progress from its beginning to its completion without its budging, and finally to permit its being used for years or a life-time without giving way. The density of the centre should be sufficient to prevent interference with permanent strength, or with the ability of the operator to accomplish all the auxiliary necessities. The density of the surface must be sufficient to permit the smooth and spotless finishing, and the permanent retention of artistic contour. The density of the margins of gold, where the tooth structure and filling join, must be sufficient to prevent and preserve a smooth and unbroken edge.

The highest type of enamel or tooth margin, which is to meet the gold margin, is that which is the farthest from forming a sharp edge or acute angle, to avoid the crumbling of the margin during insertion of the gold, as well as to prevent its breaking down by usage and time.

The highest type of gold margin which is to join the tooth margin, is that which leaves the gold the farthest from a feather edge. And as these margins of different substances are always to meet each other, an obtuse angle to its edge must be given that which needs it the most, the enamel, which is of a brittle nature; the one that should receive the most acute angle to its edge will be that which will bear it the best, viz., the gold, which is malleable, lead-like.

The highest type of completed filling is that which is truest to nature; that which will most minister to usefulness and comfort, the best prevent future decay. This means a thorough contour restoration, illustrated on the grinding surfaces of the teeth by close occlusion of the filling with its antagonizing teeth; illustrated on the approximal surfaces by close knuckling of the gold to its next-door neighbor, to prevent the crowding between the teeth of food, which destroys the inter-dental portion of the festoon of the gum, causing pain and inviting decay. The close knuckling also prevents an approaching movement of the teeth, which without the knuckling, would in many cases meet each other at the margin of the gum, destroy it, and invite decay by contact at that point. The accident most apt to befall this class of work is the entire breaking down of the gold, when improperly inserted, an accident preferable to the insidious lurking of decay behind the other class of fillings, imperfectly and loosely packed within weak retaining walls, when disastrous inroads of destruction warn the patient when it is too late, in most cases, to save the pulp or tooth.

The highest type of the dental arch completely repaired, durability and comfort being taken for granted, is that which is the truest to nature that the circumstances of the case will permit.

The highest type of gold is that which will do this work the best, the ease to the patient and operator being considered. An easy working cohesive foil is the desirable material.

The highest type of appliances to produce the result desired is that which will accomplish it the best, in the least time, with the least pain to the patient, and the least wear and tear and most profit to the operator. The hand mallet is good, but has two great objections that a mallet or plugger propelled by other force has not: it necessitates an assistant to use it, and it is slower in delivering blows. A plugger propelled by foot power does not give the operator the range of free action that one does that is operated by force independent of his exertions. The only attention that should be required is to start or stop the plugger at will, by a simple movement of the finger on the hand piece. A water power would be best, if it were possible to get the plugger to cover the ground, but water power is something that one dentist in ten possesses for such use. The electro-magnetic plugger every dentist can have, the battery requiring about ten minutes' attention and ten cents expense per week, and when the battery and plugger are once comprehended, and are in good working order, the dentist has an assistant that cannot be equaled.

Without it, the operator cannot successful compete with the operator who has it, all other things being equal. The gold works kindly under its influence, and is made as solid and at all points as is required. The patient objects to it less than to any other mannre of inserting gold that I have ever known. The operator is delighted and infatuated with its easy, thorough, and rapid working.

Any system of filling is defective that does not condense its gold well, anchor its gold well, and have its weak margins of tooth well trimmed away.

The Herbst rotary method of inserting gold permits only one of these things. Its filling are well anchored within the weak walls of the margins of the decay. The Herbst method necessitates a matrix in many or most approximal fillings, and this is a great objection, because of the complication, the matrix being a very difficult thing to apply to the infinite variety of cases met with in practice.

That Herbst performs these operations skilfully and far better than the average of dentists practicing about him

I do not doubt; but the attempts to demonstrate the superiority of the practice in this country have been lamentable failures. The rotary method of placing gold in teeth, I am happy to say as an American dentist, never would have had its birth in this land of ours, where dentistry was lifted from the gutter by our fathers, and where to-day it holds a preminent position. I am willing to meet the inventor of the rotary method of packing gold, in a friendly trial of the comparative merits of *modus operandi* with the plan of operation laid down as the correct thing in this paper. I will meet him in New York or Europe. I will operate with him in the mouth of a dentist who needs several days' work performed, he also to work in such a mouth. We will work together for several consecutive days before an audience of dentists, and let the audience see and believe, as their better judgment dictates; and if the gold building principles of Atkinson, Varney and Webb go to the wall, I am perfectly willing to go there with them, and Herbst shall triumph.

This adverse criticism of the Herbst method I make fearlessly, and I am willing to abide by the verdict that time will render. It will put many dentists struggling to attain good means to proper ends, on their guard. There are many men lacking ability and knowledge to do as well as they wish, who are ever ready to grasp at every straw they see floating on the surface, instead of striking out manfully for something that will carry them safely to the harbor of success.—*Independent Practitioner.*

ARTICLE V.

THE UTILIZATION OF WASTE SCRAPS OF OLD AMALGAMS AND BY PRODUCTS OF DENTAL PRACTICE.

BY PROF. CHAS. MAYR, SPRINGFIELD, MASS.

[Extract from a paper read before the Conneticut Valley Dental Society.]

During a practice of only a few years there accumulate in a dentist's office all kinds of scraps, mostly consisting of old amalgams, plugs, etc., they are a small affair in themselves, but so long as dentists pay $2.00 and over for an ounce of alloy, it is worth while to give five minutes' attention to a box of amalgams containing perhaps five ounces. If there is nothing but amalgam in the scraps, I think the most legitimate use to be made of them is to remelt them, to drive off the mercury, to file them and use them again. Many dentists use only one kind of amalgam; by properly conducting this process they may get as good amalgam as the original; the best way to proceed is about this:

Put the scraps into a Hessian crucible; add for every ounce of amalgam half an ounce of cyanide of potassium; heat at a dull red heat for a couple of hours in a good draft and pour the resulting metal into an ingot; it gives a cleaner product if during the process the crucible is covered.

This ingot may be filed and will be found to give as good amalgam as the original; it is important that the heat should not be too high, otherwise some tin will volatile, and thereby the proportion of the metal will be altered.

The cyanide of potassium is an excellent flux, because it melts at a low temperature and excludes every trace of oxygen. If the operator does not care to recover amalgam in this manner, he may extract the precious metals from the amalgam in the following manner:

The old scraps are melted, with access of air, in a strong draft at a temperature at which silver melts. Almost all the mercury is thus driven off, and a considerable amount of the tin oxydizes; the resulting mass is granulated by pouring it into water and then dissolved in nitric acid which oxydizes the tin and silver, and because commercial nitric acid almost always contains chlorine, so some of the gold; the greater part of the gold, however, remains undissolved in combination of oxide of tin. After the oxidation has ceased, a powder will be found floating in the liquid varying in color from white to violet; white, if no gold is present, and colored the more the greater the amount of gold. The turbid solution is diluted with water, say to five times the original volume, it is set aside for a couple of days, and then the almost colorless liquid on the top carefully poured off. This liquid contains usually nothing but silver and copper; to precipitate the silver it is poured into a solution of salt containing about half an ounce of salt for ounce of amalgam; a white curdy precipitate is obtained which is chloride of silver; by gentle shaking, it can be made to cling together and to settle rapidly to the bottom; the liquid is decanted, the precipitate washed once or twice, collected on paper, allowed to dry, mixed with about twice its bulk of black flux, which is nothing but soda and flour mixed in equal proportions. This mixture is put into a sand crucible and melted at a bright red heat. A globule of pure silver is thus obtained at the bottom of the crucible, which may then be utilized further. To recover the gold, the violet precipitate from which the first solution of silver was decanted is washed a couple of times by decantation; it is then treated with a mixture of hydrochloric and nitric acid, about one ounce for every ten ounces of amalgam; its color will disappear and a yellow turbid liquid result. This is diluted, allowed to settle, decanted and mixed with a solution of common sulphate of iron (copperas,) impure gold is precipitated as a bluish powder, it is collected on a filter, melted in a clay scorifier with a little saltpetre and repeatedly dissolved and precipitated,

In this way alone the gold can be completely freed from the tin; the oxide of tin obtained during this process may be dried and is the commercial putty powder.

I know that these things are simple, have been told often, and contain little new; but perhaps some one has not yet heard of them, and, if so, this will have been sufficient inducement for me to give this synopsis.—*Archives of Dentistry.*

ARTICLE VI.

FILLING PERMANENT TEETH OF CHILDREN.

BY C. M. MARSHALL.

Having had occasion, during the past few years, to extract many teeth for children between the ages of eight and fifteen, that han been filled with cohesive gold, and as such cases continue to present themselves to me, I wish to earnestly protest against such practice. I consider it pernicious.

1st. Because gold is not the best material we have for filling such teeth.

2d. Because a filling that will not save a tooth, serves usually to mask the real condition until pulp irritation, and frequently inflammation, ensues.

3d. Because we have filling materials that will arrest decay in these teeth, and preserve them until maturity is reached, when they will be sufficiently hardened to receive gold as permanent work.

To return to my first statement: Before maturity, many teeth are so soft that the pressure necessary to impact cohesive gold solidly in apposition to the walls of a cavity, will, in a great majority of cases, cause fractures of of the edges of the cavity. Though they may sometimes be infinitesimal, they will yield to the action of the fluids of the mouth, and further caries follow.

I moreover claim that gold is not the best filling material for such teeth, inasmuch as it requires such great endurance that a child will frequently leave your chair wishing he had not a "tooth in his head," mentally vowing he will never have another filled. Thus children in their tender years conceive an antipathy for you and your practice, which only grows with time.

In my second statement I occupy ground familiar to all. If not, let the operator who has been pursuing the course herein condemned for at least three years, come to the front and teach us, and tell us he never finds anything wrong around his gold fillings in such teeth I grant many are saved, but are we meeting the demands rightfully made upon us if we lose any, when we have charge of them at the time caries first appear, and the proper hygienic laws are obeyed? Why should one of four incisors, with caries of similar extent, be lost, after an equal amount of care has been bestowed upon filling each? If the nonsense of incompatibility is manifest in the lost tooth, why does it not exhibit itself in the others? If the mystical electrolysis does not disintegrate three, why should the fourth yield to it?

I claim for third position, that children's permanent teeth, though sometimes deficient in lime salts, can be preserved if the proper course is judiciously pursued, and in doing this I do not pretent to offer anything new to the profession, but to reiterate truths already spoken, which have proven by practice worthy of repetition. I simply add my protest against the old methods, trusting that if there is one practitioner who has not before, he may now, investigate this matter, and become better prepared to meet the just demands imposed upon him, thus honoring his profession more highly, and adorning his personal character, by increasing the gratitude and confidence of his patrons.

I recommend this practice: Fill teeth which are exceedingly deficient in stuctural constituents with either oxyphosphates or oxy-chlorides. These fillings are only intended to serve a period of six months or two years, the time depending much upon the chemical reaction of the fluids of the mouth. If, when they are partly solved, we do not find a great improvement in the texture of the teeth, we should refill them with the same material, and repeat it until there is sufficient integrity of tooth structure established to maintain more permanent work. Where we find these teeth fairly supplied with lime salts, a high standard of amalgam may be used, especially for bi-cuspids and molars, which will serve much the same purpose, requiring less frequent renewal, and possibly none at all. By this means we can bridge over the most dangerous period of carious permanent teeth, and finally fill them with cohesive gold.—*Southern Dental Journal.*

ILLINOIS STATE DENTAL SOCIETY.

The twenty first annual meeting of the Illinois State Dental Society will be held at Peoria, Ill., commencing Tuesday, May 12th, 1885, and continuing four days.

The State Board of Dental Examiners will be at the National Hotel at 10 A. M. Monday, (May 11th,) at which time candidates for examination must present themselves punctually. The examinations will occupy until Thursday, May 14th.

J. W. WASSALL, *Secret'y,*
103 STATE ST., CHICAGO.

Editorial, Etc.

Annual Commencement of the University of Maryland Dental Department.—The Third Annual Commencement of this Dental School, in connection with the Seventy-eight Annual Session of the University of Maryland, was held March 17th, 1885, at the Academy of Music, Baltimore. The exercises were opened with prayer by the Rev. Culbreth B. Perry, and after the reading of the Mandamus, the names of the dental graduates, thirty-six in number, were announced by Prof. Ferdinand J. S. Gorgas, Dean of the Dental Department.

The degree of "Doctor of Dental Surgery" was then conferred upon the following gentlemen, by Prof. Geo. W. Miltenberger who acted for the Provost of the University, the Hon. S. Teackle Wallis, L. L. D., who was absent on account of illness:

Bailey, Madison A.	South Carolina
Beadles, E. Payson	Virginia
Bradford, Henry Clinton	Virginia
Brown, Claude D.	Virginia
Carlisle, John P.	South Carolina
Carter, Joseph W.	Missouri
Comegys, Thomas M.	Tennessee
Cooke, Frank. J.	Texas
Dorset, Willie Edward	Virginia
Fournier, Jr., Joseph	New York
Groshans, Ferdinand	Maryland
Hebbel, Charles W.	Maryland

Helm, John W.	Maryland
Hill, Charles E.	Australia
Hougland, Ulysses Sylvester,	Indiana
Howland, Clarence Henry	D. Columbia
Howlett, A. Hersey	Pennsylvania
Hundley, Peyton	Virginia
Josselyn, M. D. Eli E.	New Brunswick
Kloeber, John S.	Virginia
Matthews, Augustus	North Carolina
McQuown, Robert T.	Virginia
McQuown, William P.	Virginia
Norwood, Wm. McIntosh	S. Carolina
Parker, Will W.	Minnesota
Pitts, Henry Clay	North Carolina
Perkins, Capers D:	Georgia
Ranson, Jr., James M.	West Virginia
Rutledge, Brooks	S. Carolina
Trapp, Wm. Sherman	Pennsylvania
Twitchell, Fred. A.	Minnesota
Wangemann, Albert	Germany
Welch, Floyd J.	Virginia
Wegge, William F.	Wisconsin
Wood, Frank Le Roy	Maine

The "University Pledge" relating to empiricism, was assented to by every graduate. The following prizes were then awarded to members of the Graduating Class: The beautifu "*University Gold Medal* to William F. Wegge, of Wisconsin, for the highest nnmber of votes at the examinations for the degree of "Doctor of Dental Surgery." *Honorable mention*, for second highest number John S. Kloeber, of Virginia.

The S. S. Prize—"Dental Engine," to Joseph Fournier, Jr., of New York, for the best two fillings, one of cohesive and one of non-cohesive gold. *Hon. mention*: Peyton Hundley, of Virginia.

The Snowden & Cowman Prize. Set of Chapin A. Harris Forceps" to William McIntosh Norwood, of South Carolina, for the best full upper set of gum teeth on metal. *Hon. mention*: Joseph Fournier, Jr., of New York.

The S. S. White Prize: Set of Varney's Pluggers," to Joseph Fournier, Jr., of New York, for the best partial upper set of gum teeth on metal.

The James H. Harris Prize: "Gold Medal" to Brooks Rutledge, of South Carolina, for the best nou-cohesive gold filling. *Hon mention*: John P, Carlisle, of South Carolina.

The B. M. Wilkerson Prize: "Gold Medal," to Joseph Fournier, Jr,, of New York, for the best continous-gum set.

The R. Y. Henley Prize: "Gold Medal to Joseph Fournier, Jr., of New York, for the best combinatiou set of celluloid and metal with Soldered rim.

The Chas. L. Steel Prize: "Gold Medal," to Frank Le Roy Wood, of Maine, for the. best cohesive gold filling. *Hon. mention*: Thos. M. Comegys, of Tennessee.

The Jno. C. Uhler Prize: "Gold Medal," to Clarence H. Howland, of District of Columbia, for best Celluloid set.

The Blake & Co. Prize: "Taylor Automatic Mallet" to Brooks Ruutledge, of South Carolina, for best gold filling in specimen tooth,

The B. H. Catching Prize: "Southern Dental Journal," to Floyd J. Welch, of Virginia, for best examination on Dental Materia Medica and Therapeutics.'

The Valedictory Address was delivered by Prof. R. Dorsey Coale, Ph. D. and was replete with excellent advice to the graduates and was attentively listened to by the large audience present. The exercises closed with the benediction.

The number of matriculates for the Session of 1884-'85, was seventy-four, all of whom were dental students from every part of this country, Germany, Belgium, France, Australia, Mexico, New Brunswick, and Brazil.

The Annual meeting of the Alumni of this Dental Department was held on the evening of commencement day, and was presided over by Dr. R. D. Dodson, the Vice-President—owing to the absence of the President Dr. Hungerford, on account of illness. The Alumni Banquet took place at the Howard House at the close of the meeting, and was enjoyed by a large number of prominent dentists in connection with the graduating class.

The "class contest" for Prizes was held March 14th, 1885, in the Infirmary and was a very interesting occasion, occupying the entire day. The following gentlemen acted as committees in making the awards: Drs. George B. Steel, of Va., William S. McDowell, of Md., E. B. Bliss, of D C., Geo. H. Chewning, of Va., R. Y. Henley, of Va., A. C. McCurdy,

of Md., R. D. Dodson, of Pa., L. C. Tucker, of Va., Wm. R. Renalds, of Va., M. G. Sykes, of Md., B. M. Hopkinson, of Md., and D. Genese, of Md., all of whom were greatly pleased with the proficiency exhibited by the competing students.

SOME EXPERIMENTS WITH "MURIATE OF COCAINE" IN THE DENTAL INFIRMARY OF THE UNIVERSITY OF MARYLAND. Chas. L. Steel, M. D., D. D. S., Demonstrator of Operative Dentistry.—As soon as this new aæsthetic was brought to the notice of the profession, experiments were introduced with in the Dental Infirmary of the University of Maryland. At first we could only procure a 2 per cent. solution. This was tried for extracting but with very little effect. Subsequently the 4 per cent. solution was tried, but with little if any improvement. About this time, Messrs. McKesson & Robbins very kindly supplied us with a sample of their 5 per cent. oleate. It is a well known fact that most medicines in the form of oleates permeate the tissues more readily than in any other form. I therefore hoped to find marked improvement in the degree of anæsthesia produced by the use of this preparation—nor was I *entirely* disappointed. I am sure that I have produced complete anæsthesia of the *gum* with the oleate. In one instance a very firmly retained temporary tooth was removed, *apparently*, without *any* pain—in extracting roots, with little or no bony attachment, the anæsthesia was very decided. When we come, however, to use it in the extraction of teeth more firmly implanted, I consider it as almost valueless. The pain from the extraction of a tooth is deep-seated for an agent, so notably superficial in its action as is cocaine, to be of material benefit. Possibly we may sometimes discover some method of application by which it will be more effective. I applied the oleate with a camel's hair brush, keeping the gum as dry as possible, and painting with the oleate seme six or eight times in the course of ten minutes. In using the cocaine for obtunding sensitive dentine, the experiments were much more satisfactory. A student came to me one day complaining that he had, with much trouble, received the decay from two shallon, saucer-shaped canties, but that the patient was so nervous and the teeth apparently so sensitive, that he could not properly prepare the canties for the retention of the fillings. I directed him to put on the rubber dam, and as soon as this was done, I dropped a little of the 4 per cent. solution in the canties and in about five minutes, the dental eugine was used, the canties nicely prepared and *no pain experienced by the patient.* In numerous other cases, it was used for sensitive dentine, with varying successes, but always with decided advantage. We are not always safe to rely upon the statements of patients and I am therefore glad to be able to record the testimony of a student, in whose tooth it was used, as they (students) can usually speak more intelligently about these matters, than an ordinary patient can. Mr. C. had a cavity in the anterior approximal surface of a lower molar. It was so sensitive that he had never been able to stand the pain of attempted excavation. By repeated applications of the cocaine the cavity was finally prepared most satisfactorily and although some pain was felt yet it was greatly alleviated.

Unquestionably, in my opinion, cocaine is the best obtunder of sensitive dentine, which we now have, but the question still remains to be proven ; will it produce any tasting and injurious effect on a nerve which might be preserved if this drug were not used?

In another existance the cocaine was used most successfully by a student in extirpating a large fungous growth from a tooth.

In my private practice I have used it quite extensively. In one case, I succeeded in extirpating a live nerve, *absolutely without pain.* In this case, I used the pure alkaloid, applied on a piece of moistened cotton.

The drug is as yet too young to have its place Dentistry, distinctly defined, but that it will have a prominent position in our medicine case, I doubt not.

MONTHLY SUMMARY.

DAKOTA DENTAL LAW.—An Act To insure the better education of practitioners of Dental Surgery and to regulate the practice of dentistry in the Territory of Dakota.

Be it enacted by the legislative assembly of the territory of Dakota: Section 1. That it shall be unlawful for any person to engage in the practice of dentistry in this territory unless he or she shall have obtained a certificate, as hereinafter provided.

SEC.—2. A board of examiners, to consist of five practicing dentists, is hereby created, whose duty it shall be to carry out the purposes and enforce the provisions of this act. The members of said board shall be appointed by the governor, who shall select them from ten candidates, whose names shall be furnished him by the South Dakoia Dental society and the Northwestern Dental as sociation, each shall furnish the names of five candidates, and the governor shall select at least two from each five names so furnished to be members of said board. The term for which the members of said board shall hold their offices shall be five years, except that the members of the board first to be appointed under this act shall hold their offices for the term of one, two, three, four and five years respectively, and until their successors shall be duly appointed. In case a vacancy occurring in said board, such vacancy shall be filled by the governor from names presented to him by the Northwestern Dental association and the South Dakota Dental society. It shall be the duty of said dental organizations to present twice the number of names to the governor of those to be appointed.

SEC. 3. Said board shall choose one of its members president, and one the secretary thereof, and it shall meet at least once in each year, and as much oftener, and at such times and places, as it may deem necessary. A majority of said board shall at all times constitute a quorum, and the proceedings thereof shall at all reasonable times be open to public inspection.

SEC. 4. Within six months from the time this act takes effect, it shall be the duty of every person who is at that time engaged in the practice of dentistry in this territory to cause his or her name and residence, or place of business to be registered with said board of examiners, who shall keep a book for that purpose.

The statement of every such person shall be verified under oath, before a notary public or justice of the peace, in such a manner as may be prescribed by the board of examiners.

Every person who shall so register with said board, as a practitioner of dentistry, may continue to practice the same as such, without incurring any of the liabilities or penalties provided in this act, and shall pay to the board of examiners for such registration a fee of one dollar.

It shall be the duty of the board of examiners to forward to the register of deeds of each county in the territory a certified list of the names of all persons residing in the country who have registered in accordance with the provisions of this act; and it shall be the duty of all registers of deeds to register such names in a book to be kept for that purpose.

SEC. 5. Any and all persons who shall so desire may appear before said board at any of its regular meetings, and be examined with reference to their knowledge and skill in dental surgery; and if the examination of any such person or persons shall prove satisfactory to said board, the board of examiners shall issue to such persons, as they shall find to possess the requisite qualifications, certificate to that effect, in accordance with the provisions of this act, said board shall also indorse as satisfactory diplomas from any reputable dental college, when satisfied with the character of such institution, upon the holder of such diploma furnishing exidence, satisfactory to the board, of his or her right to the same.

All certificates issued by said board shall be signed by its officers, and such certificate shall be prima facie evidence of the right of the holder to practice dentistry in the territory of Dakota.

SEC. 6. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdeameanor, and upon conviction may be fined not less than fifty dollars nor more than one hundred dollars, or be confined six months in the county jail.

All fines received under this act shall be paid into the common school fund of the county in which such conviction takes place.

SEC. 7. In order to provide the means for carrying out and maintaining the provisions of this act, the said board of examiners may charge each person applying to or appearing before them for examination for a certificate of qualification, a fee of ten dollars, which fee shall in no case be returned; and out of the funds coming into the possession of board, from the fees so charged, the members of said board may receive, as compensation, the sum of five dollars for each day actually engaged in the duties of their office, and all legitimate and necessary expenses incurred in attending the meetings of said board; said expenses shall be paid from the fees and penalties received by the board under the provisions of this act, and no part of the salary or other expenses of the board shall ever be paid out of the territorial treasury.

All moneys received in excess of said per diem allowance and other expenses, as above provided for, shall be held by the secretary of said board as a special fund for meeting expenses of said board and carrying out the provisions of this act, he giving such bon is as the board shall from time to time direct.

And said board shall make an annual report of its proceedings to the governor by the 15th of December, of each year, togerher with an account of all moneys received and disbursed by them pursuant to this act.

SEC. 8. Any person who shall receive a certificate of qualification from said board shall cause his or her certificate to be registered with the register of deeds of any county in which such person may desire to engage in the practice of dentistry, and the registers of deeds of the several counties in this territory shall charge for registering such certificate a fee of twenty-five cents for such registration.

Any failure, neglect or refusal on the part of any person holding such certificate to register the same with the register of deeds, as above directed, for a period of six months, shall work a forfeiture of the certificate, and no certificate when once forfeited shall be restored, except upon the payment to said board of examiners of the sum of twenty-five dollars as a penalty for such neglect, failure or refusal.

SEC. 8. Any person who shall knowingly and falsely claim or pretend to have or hold a certificate of license, diploma or degree granted by any society, or who shall falsely and with intent to deceive the public, claim or pretend to be a graduate from any incorporated dental college, not being such graduate, shall be deemed guilty of a misdemeanor, and shall be liable to the same penalty as provided in section 6 of this act.

SEC. 10. This act shall take effect and be in force from and after its passage and approval.

Approved March 10th, 1885.

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ARTICLE I.

CHICAGO DENTAL SOCIETY.

This Society held its regular monthly meeting February 3, President A. W. Harlan, in the chair.

Dr. J. H. Woolley read a paper on the "First Permanent Molar."

ABSTRACT OF DR. WOOLLEY'S PAPER.

There are many causes at work to produce a healthy, or unhealthy condition of the teeth under consideration, such as hereditary and pre-natal influences.

The age we live in, and the manner of life of the child, together with its inheriting a highly nervous organization, all combined, prevent a harmonious development of the first permanent molar. Neglect upon the part of the parent and dentist plays an important part in the early destruction of these teeth. Mr. Tomes' record of 3,000 extractions of teeth, one-third of them being first permanent molars, does not seem to me a fair test, as a majority of the extractions occurred among the poorer classes in hospital practice. Many dentists believe these teeth are short-lived and that the space gained by their removal prevents decay of those remaining.

About the time of the shedding of the central incisors four first permanent molars appear, and at a time when most of the temporary teeth still remain. By carelessness or inattention parents overlook these teeth, or, if they are noticed, they suppose them to belong to the first set.

The child is brought to the dentist on account of toothache. Many dentists finding the child difficult to manage, hurry through the operation, with the result that the operation is often imperfect and sometimes a complete failure.

By the extraction of the first permanent molar, it is claimed there will be room gained for the biscuspids and canine teeth to fall back, and the space gained prevents these teeth from decaying. I, as well as others, have found that the removal of these teeth made very little difference in regard to the decay of the remaining ones; also that the anterior teeth seldom move back, but forward. Here followed a quotation from Dr. Arthur supporting this position.

It may be necessary to remove these teeth in some cases, because of decay, but it is a mistake to remove them to correct irregularities. It is the opinion of many of the best authorities, that irregularities are not caused by lack of room in the jaw. Quotations from Dr. Kingsley and Mr. Tomes were introduced to substantiate this view. In a majority of mouths in cases of irregularities, I have found by measurement of the models of these mouths, that there was room enough to bring the teeth into position without the extraction of the first permanent molar. The extraction of these teeth causes a depression in the face and a lost of individual expression and also effects the voice.

In a private letter from Dr. A. G. V. Black he says: "One point that I have especially urged is the office of the first permanent molar in holding the jaws in position during the process of the shedding of the temporary teeth. This point so often overlooked I deem very important. These teeth take their position before the beginning of the shedding, and while the antagonization is otherwise broken up they the jaws in position and prevent any twisting of them by the powerful masseter and temporal muscles; a thing that is very liable to occur if this support is lost by the removal of any one of them before the twelfth year molars have come into position.

If these teeth could be kept until the child has arrived to its teens, their chances would be good for permanent retention." He further says "my study of the comparative liability of the teeth to decay at the different periods of life, shows clearly that the first molars are attacked in the first two or three years after eruption much oftener than any other teeth, but in after years they are attacked less often then the second.

If both the teeth are in a fair condition at the age of fifteen the chances for the first are better than the second. Decay occurs on the posterior surface of the second molar much oftener than in the same position on the first, and is much more difficult to treat."

Many claim the first permanent molar will last but a few years. Experience in the treatment of these teeth for a number of years, has taught me if they are watched with the same zealous care as others, they in all probability can be saved.

In making an examination the coffer dam should always be used, as the crowns of these teeth can then be examined more critically. If the temporary molar is in close contact with the first permanent molar, the distal surface of the former should be separated therefrom with a safe-sided file, and if the mesial surface of the latter is superficially decayed, the decay should be removed.

The tipping or lapping of the crowns of the second and third molars is occasioned by the loss of tissue, as a result of the extraction of the first.

Great care is necessary in the treatment of these teeth. In large cavities my mode for the last few years has been different from that previously followed.

In deep cavities that are sensitive, with approximate exposure of the pulp, some of the cements should be used for filling. Flow the cement over the floor of the cavity and after hardening fill the remainder with the same material mixed harder. When the cement begins to wear away, if the tooth has caused no trouble, remove a portion of the cement and fill with tin and gold combined or with whatever material is best suited to the case.

I believe these teeth more susceptible to thermal changes when metallic fillings are used than are other teeth.

In conclusion, I believe that when these teeth, particularly in the first two or three years after their eruption, are studied and properly cared for ; the universal verdict will be it will be the fault of the dentist and not of the tooth if they are not saved.

DISCUSSION.

Dr. Noyes.—It seems to me that the conclusions of the essayist are just, and that the first molars eminently deserve the strong pleadings for their care and preservation which we have frequently heard of late. They are, normally, the largest teeth in the mouth, with the most perfectly and strongly developed roots. They have the largest masticating surfaces and stand in the places where the largest amount of chewing is most easily done. It seems, therefore, that they were intended to be the most important of the molar teeth.

The question of their preservation or removal should be carefully considered in each case upon its merits, and the judgment should not be warped by a predisposition derived from the general statement wich we sometimes hear expressed, that "it is better in most cases to remove them." or "if the teeth are at all crowded and of poor quality it is almost always better to extract them," and others to the same purport. If they cannot be preserved, I believe less harm will result from their loss, and equal advantages will be usally gained if their extraction is delayed (as it can usually be by taking care of them) till the bicuspids and second molars are in their places and have acquired their normal articulation and their roots become fully formed. Nature puts the first molars in their places, strongly and fully developed, and meeting each other squarely, before the temporary molars and cuspids begin to loosen, and during several years they furnish the only adequate support and resistance to the action of the powerful jaw muscles, permitting the bicuspids and second molars to attain their proper length and perfect their roots before they are called upon to do full work. If the first molars are absent during this time, the undue force brought to bear upon half grown teeth may drive them out of their places with varying degrees of irregularity, or they may be prevented from attaining their proper length, and the too close approximation of the jaws may cause the upper front teeth to project forward, or in some other way mar the features. You have all doubtless seen some deplorable results that might with probability be referred to this cause.

Dr. Ames.—One point of the paper as I understand it, is that the first permanent molars being extracted, the teeth anterior to it would invariably fall forward. As a natural result of the occlusion of the bicuspids I have found that the second superior bicuspid will move backward, but I have never observed any such results as referred by the essayist. In my early practice I extracted first permanent molars, expecting beneficial results, but discarded that practice some few years since. They are, anatomically, the best teeth in the mouth, and the cases are very rare in which these teeth cannot be retained to answer a useful purpose. The essayist remarked also that the teeth of the young are more sensitive to thermal changes. This, of course, is naturally the case; but I think the pulp of a tooth which has recently erupted will recover from more irritation than that of an adult tooth. The blood vessels are more numerous and are not so apt to become strangulated at the apical foramen as a result of irritation.

Dr. Brophy.—It appears to me that a great deal of unnecessary time is spent in the filling of these teeth. It has been my practice for some time to introduce cement and keep it there until it wears away, put in some more, and so treat such cases until patients have arrived at an age, where it will be worth one's while to introduce gold. In treating a first permanent molar at seven, ten or twelve years old, I would prepare the cavity as well as I could and would, as a filling material, use oxyphosphate of zinc. It doesn't require much pressure to destroy a pulp. Fill the cavity as well as possible, and subsequently when the cement has worn down somewhat, cut out the margins and put in some oxchloride instead of oxyphosphate, because the latter is much harder, and consequently better, provided it is kept dry. I find this to be an excellent practice. In teeth where the pulp is partly or nearly exposed, I prefer to introduce gutta-percha rather than the chances of destoying the pulp by introducing any of the cements. I think it is the best way of all to fill teeth of that kind. Teeth are like apples in one respect. One bad one will spoil the whole lot, and this is particularly true with regard to the first permanent molar, which contracts decay from the adjacent temporary. Children in a great many cases dread dentists, and this dread is due to unnecsssarily long and painful operations. I don't think amalgam should be used in the first permanent molars of a child.

Dr A. E. Matteson.—I have a case in hand at the present time which has caused me considerable solicitude, and is undoubtedly the result of neglecting the sixth year molars. It is that of a miss of fourteen years, of highly nervous organization. The crowns of the inferior left and superior right sixth year molars were decayed to the margin of the gum, the pulps of both were hypertrophied to the extent of nearly filling the cavity of decay. Owing to the pain caused by masticating upon these during the time of the eruption of the twelfth year molars, the proper articulation has been lost in the ten anterior teeth in each jaw, and are not occluding by 3-16 of an inch, the twelfth year molars preventing it. Have extracted the offending sixth year molars, and would like to hear any suggestion as to the best method of correcting the irregularity.

Dr. Pruyn.—I would like to hear Dr. Allport answer this question.

Dr. Allport.—In answer to the question propounded by Dr. Matteson, I will say that in order to answer it intelligently it would first be necessary to know how near the anterior teeth come together, as well as several other surrounding conditions. But assuming that they come within just 3-16 of an inch, as stated by Dr. Matteson, and that the molar teeth mentioned were the only cause that prevented a perfect occlusion of the anterior teeth, I think I might possibly cut off the grinding surfaces of the molars as far as I could without endangering the vitality of the pulps, or until the anterior teeth came nearly together. Then with a plate, or with wedges, I would move these teeth in their sockets to excite such a development of the jaw as would produce a perfect occlusion of the remaining teeth.

In regard to the first permanent molar teeth—the subject of the paper—I will say that if I were asked to state what one thing in my opinion in dental practice required the most enlightened judgment, I should unhesitatingly reply, under some circumstances, the proper treatment of the first permanent molars.

That they should, if possible, be saved when the retention will not endanger the health of the patient or impair the usefulness of the other teeth does not admit of a doubt. An organ should not be sacrificed so long as the health of the individual is not endangered or the usefulness of other organs of the economy impaired. This is a good rule in general surgery and should hold good in dentistry, for dental surgery is but a part of general surgery.

No reasoning would as thoroughly convince me of this, as have the many years of observation I have had, in examing the mouths of my own patients as well as those of other dentists who have followed widely different views in practice regarding the treatment of these teeth, some attempting to save nearly all of them and others giving largely to extracting them. If the teeth and jaws are harmoniously developed, the teeth all well formed and dense in structure, the extraction of these teeth would certainly be bad practice; but unfortunately these conditions do not always exist, and our practice should be aimed to secure the best results possible under the existing conditions.

To say that these teeth should always be retained, if possible, as intimated by the essayist, is a very broad assertion, for it will be frequently found that greater injury will be caused to the other teeth by their retention than the patient would suffer by the loss of them. So it is not alone the possibility of saving the teeth that is to be considered in determining what should be done with them, but the amount of injury likely to occur consequent upon their retention. "The greatest good to the greatest number," in this as in other things, is a wise maxim to follow.

The condition of the surrounding teeth, as I have previously said, is an important factor. If the teeth are soft and predisposed to decay, and if in addition to this they are crowded, it is often necessary to remove more or less of the proximate surfaces when decay has attacked these locations. Then from imperfect operations or a lack of cleanliness decay often takes place around these fillings and they have to be removed; more or less of the surface is again cut away and by the time the patient is 35 or 40 years old, less grinding surface will be left and the mouth will not be in as good a condition as through these teeth had been extracted at the proper time.

There is no use in saying that this is not true, for old and good practitioners of close observation *know* that it is a fact.

Dr. Harlan.—How about these teeth when they have lost their pulps?

Dr. Allport.—With regard to the question just asked by Dr. Harlan, "How about these teeth when they have lost their pulps?" I will say, during the last few months we have seen a good deal in the dental and medical journals about "Dead teeth in the jaws," and some good things have been said both for and against the practice of retaining them, and some other things had better not have been said at all. Whatever of truth has been said against the practice in general is eminently so in regard to young patients, for whatever injury is done must be consequent upon the gases generated by the decomposition of the organic tissue within the pulp canal and the dentine, by septic influence or pressure upon the surrounding tissues. This may be produced at the apex of the root, or possibly through the cementum upon the peri-cemental membrane.

The younger the subject the greater the amount of organic tissue in the dentine, and consequently a greater amount of these gases will be formed by the processes of decomposition, and the younger the subject the more certain will it be for deleterious effects to follow. It is true these roots may be filled, which will go far towards preventing these conditions; but the greatest skill in this direction will not always prevent after trouble.

An alveolar abscess is not the only cause that may call for the removal of such teeth, and the neural troubles, urged as a cause for their extraction, seldom arise from acute inflammation or from alveolar abscess.

The diseases of the eye and ear mentioned in the discussion in the *Medical Record*, and other journals, as the result of retaining these teeth in the jaws, is not altogether improbable, because the low form of irritation so frequently produced in the peri-cemental membrane by the gases generated within the root canal, or in the tubuli of the dentine, is the most fruitful source of reflex nervous conditions associated with the teeth; and many times these reflex troubles arise from a state of irritation so low as to be very difficult of detection and quite likely to escape observation, even after a most careful examination, as has been proved by the cure of the diseases on the extraction of the teeth only suspected of being the harbor of the mischief caused; and if these conditions are produced in older subjects by the retention of these teeth, we should be cautious how we keep them in the mouths of our young patients.

Dr. Pruyn.—At what age would you extract these teeth?

Dr. Allport.—Unless there was some good reason for their earlier removal, I should with inexpensive fillings try and keep them until the patient was fifteen or sixteen years old, or until such time as the natural occlusion (inter-locking) of the teeth was perfectly established.

Dr. J. S. Marshall.—It was my privilege for many years to practice in the same city in which that prince of dentists, Dr. Amos Westcott, spent the greater part of his professional life, and I observed that it was his practice to extract badly decayed first permanent molars, rather than to devitalize the pulps and perform extensive operations upon them. The result of this practice —when performed before the eleventh year—I often noticed was in many cases to prevent approximal decay upon the side of the arch from which the tooth was removed. To illustrate—and this is one from a great many that might be cited—a young gentleman had the first permanent molars extracted upon the left side when about ten years of age; at twenty-seven he had not a single approximal cavity in the teeth of that side, while upon the right side the first permanent molars had been allowed to remain, and I found the bicuspids and first and second molars all had approximal fillings in them.

I have seen the same condition of things in the mouths of patients who had been under the professional care of other noted practitioners. As a consequence of this observation, backed by my own experience, I am now in the habit of extracting these teeth if I find them very badly decayed and associated with exposed or dead pulps, and consider it good practice to do so. Of course I would not extract them under all and any circumstances; judgment must be exercised, and the present conditions as well as the future possibilities taken into considerations. It has been my experience that when these teeth were removed before the eleventh year, the second molars have come forward and taken the place very nearly of the extracted teeth, and their loss has hardly been recognizable. I have no hesitation under certain circumstances, viz.: when the teeth are soft, badly decayed and much crowded in the arch, of extracting all four of the permolars as a prophylactic measure. Such treatment gives space for the remaining teeth, places them in a better condition to be kept clean, and consequently caries is less likely to appear upon the approximal surfaces.

Dr. Crouse.—I had thought I would not speak on this subject and do not know now as I ought to say anything. For, in doing so I must take radical ground against some who have spoken who are men of reputation, and such differences must have a tendency to mislead the young practitioners and cause them to think there are no established facts in dentistry. There are established principles and there are the facts which should act as a guide in helping us to decide how to treat even the sixth year molars.

The last gentleman on the floor (Dr. Marshall) cites a case where the first molar had been extracted and states that the approximal surfaces of the rest of the teeth on that side were all sound requiring no filling, while on the other side the first molar was let remain and all the teeth on that side required constant filling. He then asks us if that is not sufficient proof of the soundness of the practice of extracting this tooth. Why I could cite a hundred cases coming under my own observation, where in consequence of the early extraction of the sixth year molar, the usefulness of the balance of the teeth on that side as masticating organs where, if not wholly, to a very great extent, destroyed. The loss of the first molar allowed the bicuspid, not as urged by the essayist, "to go forward," but to lean backward, and the second molar to pitch or lean forward to so great an extent, many times, as to allow the tops to touch each other, thus destroying the natural antagonism, and instead of the teeth above and below matching into each other they only touched here and there on the extreme points. The mal-position thus cause made it next to impossible to save the second molar and bicuspid. With the first molar and its socket gone, and the tops of the two teeth touching, the large space is left below, and with the decks of both teeth exposed even to a considerable portion of the cementum, it will be impossible, many times, to prevent caries from going on in this pocket by any amount of filling. Too often have I seen the usefulness of the teeth destroyed by the loss of the sixth year molar in the manner I have already described, to advocate such a practice. When I have seen God's handiwork thus multilated and an irreparable injury done the patient by the hand of what was called a dentist, and then see in my next journal somebody advocating the extracting of the sixth year molar, it has made my blood boil, knowing that such advice would cause many a young practitioner to destroy or greatly injure what would, if otherwise treated, have been a complete and perfect masticating apparatus. If I cannot do better, I prefer to keep the roots filled and keep them as long as possible to make the other teeth keep their normal position.

We have heard also about the gases in these sixth year molars from a practitioner of reputation, Dr. Allport, and have been told that when the pulp is dead the sixth year molar should be extracted on account of its gases in the tooth being very injurious, ect. Grant that a tooth with decomposition and gases in the roots does do injury; why extract the sixth year molar under such conditions sooner than any other tooth with a dead pulp? Treat them and get rid of the gases, then fill the roots properly, and I will warrant no injury will come from them in that condition. There is a class of cases, however, in regard to which I am more in doubt, that is, when the pulp has been lost at a very early age before calcification has nearly completed its work; where even the end of the root from this early death of the pulp has not been completely formed, so that the entire end is open, making it almost impossible to fill them properly or perfectly. If there are any cases where I would extract, it would be these, and I would not in these cases unless I was obliged to. I would try and keep them until the other teeth had taken their natural antagonism. If I were obliged to lay down any universal rule on this subject, I should say *never* extract the sixth year molar. Such a rule would be far better than what has been advocated here to-night, viz, to generally extract, or to extract even any considerable number. I should say *seldom* should the sixth year molar be extracted. I was glad to see the essayist take the radical ground he did against extracting them. The proportion of honest practitioners who extract this tooth, as a general rule, is growing less and less, and thank God for it.

Now in regard to the case spoken of by Dr. Matteson. If I have anything like the correct idea of the case, I should expect, if the patient is young, that time would remedy, to a considerable extent, the deformity. It is perfectly natural for the teeth to articulate. You will see this illustrated in a practical way, if you will cap some of the teeth, or allow a plate to be worn which will keep part of the teeth from striking, how soon the others will elongate. I should be very slow to grind off three-sixteenths of an inch from each of the second molars. It occurs to me that anything like that proportion of grinding would destroy too much tooth; in fact, I don't think it could be successfully done. I should expect time to work wonders in that case.

Dr. G. W. Nichols was delighted that a subject had at last been reached on which there was a similarity of views. As regards the sixth year molar he wished that he had never seen one. It had caused him unlimited trouble, and he thought it was a serious commentary upon modern civilization, parentage, life, knowledge and practice. Young married couples rushed into parentage without the least idea of the consequences entailed and attending the sixth year molar. He maintained that no couple should get married, and that no minister should perform the ceremony without seeing that they were posted with regard to the temporary teeth. He was puzzled every day of his life about these teeth, what to do with them. Trying to save them had shortened his life. If there was a certain class of the community that should understand the condition of these teeth, it was the family physicians. Ignorance on the part of parents might be excused, but a lack of knowledge on the physician's part could never be. Nineteen out of every twenty graduates of medical colleges ***know nothing about the sixth year molar.*** Physicians should be able, and taught to consider it their duty, to inform parents of the possible decay of these teeth, and it should be the duty of college faculties to see that no one graduates who is in ignorance about the sixth year molar. The question of extraction or retention of such teeth was a hard one to decide, but the longer he lived the more he would endeavor to save the last one of them, but the last one he would extract, if necessary.

Dr. Woolley in closing the discussion, said: If we imbue our patients with the necessity of preserving these teeth, speak to them intelligently, and secure their co-operation in our labors, we shall accomplish better results.

On motion the society adjourned.—*Archives of Dentistry.*

ARTICLE II.

SYMPTOMATIC PATHOLOGY OF THE MOUTH.

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From the earliest transmitted records of the curative art, the mouth, has been, with its adjuncts, consulted for reflex evidences to determine in the mind of the remedial practitioner the nature and location of disease; as the rehearsal of patients' impressions would naturally attract his attention to its indications, and from experience the observing student must have appreciated the reactive value of its symptoms. The receptive mouth with all the elementary distinctions of taste for tissue co-operative representation, would not be perfect for organic reciprocation in the expression of desire in the selection of food and gustatory satisfaction in digestive disposal, without a special reactive communication through which to signal ill effects. The possession of this power, which observation had established as a reality, was gradually developed into more extended knowledge of individual organic demonstration, when anatomy opened to view physiological effects from the combination in action of systematic parts. Over these functional reciprocations of want, supply, and effect, necessary for healthy sustenance, the will—or with cultivation, the mind-as commissary held control. But as the attractions of association became disseminated, drawing together individuals subject to varied climate and engendered habit influences, their adverse adoption, without consideration of cause and effect, led naturally to the multiplication of disease and confusion in the blending of mouth indications characteristic of organic impression and complications. In primitive simplicity the animal desires held ruling sway, and by appetite and passion, wrought through the prima via and genito urinal glandular connection, direct symptoms in reaction; but now with the multiplied complications of disease; there are in sequence interruptions and accessions in transmission that render a reliable systematic diagnosis difficult. But the inordinate use of the procreative organs has produced a retrograde action, so marked, that venereal and cancerous diseases, are, by metastasis often transferred to the mouth, as if in direct reproff for exampled correction of deleterious habits. Although, there are variations in the virulence and translated seat of attack, the inner periosteum of the mucous membrane attachment is usually the seat, and if there is a defective tooth its alveolar process becomes the central point of invasion, and by necrosed gangrene the sockets are quickly destroyed and its roots dislodged.

But, if in anticipation, the characteristics of the disease have been diagnosed correctly, with the first appearance of the fungoid and liver-hued protrusion of the gum attachment, the tooth should be extracted and sloughing caustics applied to the depths of its sockets and to the adjoining parts beyond the evidences of diseased action. If the osteo-sarcomatous cancer by translation, once gains full headway in its attack upon the superior maxillary bones it is hard to arrest, and as it bygangrenous action disintegrates the bony structure it is generally slower in progress than the venereal disease which by destroying the cartilaginous union of the bones, detaches them without injuring the integrity of their structure. That the diseases had a common origin is sufficiently clear from similar peculiarities developed in progress, the cause of deviation being rationally accounted for from hereditary and contingent impressions.

There are families with ancestral pedigrees which have been noted for simplicity in dietetic and other habits that insure freedom from the malignant fungoid diathesis, and we can reasonably suppose that there was a period in the offshoot colonization of races, in which self-supporting labor insured immunity from the taint; or if incurred before separation, the natural means for rehabitation from the excesses which have always followed as a sequence of over-populous association. From the colonistic regenerations it is difficult to detect the exact date which was noted for the inception of a new disease and the immediate causes that contributed to its development. Even at the present time, with the multiplicity of means and trained minds for tracing cause in contributing degrees to effect, contagious and epidemic diseases appear and for periods more or less protracted hold destructive sway, and although a large quanity of ink is expended in conjectural investigation, their periodicity is not deterred or destructiveness mitigated; and future generations will be as little benefited by the sage conclusions of the writers, as we are by those who discoursed upon the origin and cause of the Egyptian plague an advent of cancerous degeneration with its remote source from or alliance with venereal contagion? Yet, the criticial reading of all that is judiciously written is an incentive to thorough comparison, and serves by training the mind for analytical investigation,, to prepare it for a legitimate course of research.

Of four hundred and seventeen tumors and deep seated excrescences suppurated out with escharotics, nine were of osteosarcomatous type, with the periosteum of the jaws, palate and other adjunct bones implicated as the attractive cause of secondary translation from irritation of the gravid uterus promoted from indigestible substances taken into the stomach to gratify the cravings of a morbid appetite. With an ordinary endowment of reason and fear of pollution, one would naturally suppose that in anticipation of venereal and cancerous inflictions, the sensuous appetite would be held under restraint, for they are by far, the most disgusting and loathsome of human maladies; as the victims are forced to realize, living, the horrors of the tombs, post mortem decomposition, and endure, not only the involuntary aversion of their associates of the human species, but of the lower orders of domestic animals, and above all their own existence. Notwithstanding physicians had noted that the aching of defective and sound teeth was caused by metastatic translation during the period of utero-gestation, from some inherent source of irritation peculiar to the habits or condition of the individual affected, they gave no more heed for the detection of source or in search of the tissue of transfer than the sectarian religious devotee does to the rationale of viaticum ceremonies as passports of reality to places of future soul existence, rated theologically as intensely happy or miserable. Over-feeding and rich diet, were known to produce gout and a deposit of earthy salts in the joints of the ankles and toes, in connection with renal and urinal formations, in kind, agglutinated or phosphated together to obstruct the ducts and vasa valves of excretion, by the earliest medical writers. Yet, to the present day the drain passages by the feet, whether deep seated lymphatic ducts or glandular tissue of syphon gravitation operated upon by peristaltic ejective contraction with spincter regulators, remains a question of doubt. Although unrecognized, still, that there is an important drain existing for conducting effete matter through or from the excretions of the lower extremities terminating for discharge from the plantar surface and between the toes, the merest tyro in medical science must acknowledge with the exercise of his powers of experimental observation. That it is separate from the external or superficial lymphatic system is evident from the peculiar reactive effects produced when the septic matter is retained from their closure; local pains, and disease with varicose veins indicating the passive resistance of gravitation or valvular hindrance to active re-absorption for the implication of the vital organs. The anatomical funnel-form taper of the leg from the thigh to the knee, and calf to the ankle, shows a constructive design in furtherance of the drainage system; and at the same time presents the natural probabilities of a provision to guard against reflux action; and the diseases, and their position and sequent stages of development in foot and ankle with their slow upward progress, confirms to a degree of certainty not only the existence of valves but the power neccessary for their operation. The movements of the leg in locomotion from muscular expansion and contraction, with their peculiar leverage attachments, naturally pre-suppose the ejective requirements of compression in the alternations of extension and relaxation, which from circumscribed pecularities of the dependent limbs would react upon the tubular vessels for the conveyance of fluids, that did not possess the ringed protection of the arteries, which of themselves derive their systolic action from the heart. These combined actions imply for healthy support a certain degree of voluntary motion, and when deprived of it, from torpidy superinduced by stomach engorgement of over distention, or by indigestible food, as an inevitable consequence stagnation ensues, and in the unrelieved vessels effete deposits more or less pernicious and difficult to be removed by the resumption of healthy diet and exercise. If the contra-indications are persisted into an accumulative extent, that precludes relief from the power of physicial reaction promoted by the resumption of healthy requirements, by slow degrees local septic impression forces the natural barriers and from the accretion of disorganization reaches within the scope subject to more direct vital absorption. At this stage the glands of the mouth and throat with the mucous membrane show reactive signs of participation symtomatic of the nature of the disease. Although previously sufficiently marked for the detection by the experienced eye, the pathognomonic symptoms in revulsion give plain expression to the nature of the disease and organs affected in transition. The evidences of these forced retrograde operations of absorptive transfusion, are upon studied investigation easily traced, and established in the mind of nature's student as matters of fact, readily demonstrated to the senses. The wonder is, that even in negligence of omission, the adjuncts in the drainage of the feet should have remained so long unregarded in their importance upon the health of the general system as to be left to the thoughtless cleavage clippings of the "corn doctor."

In verification of the existence and fact importance of the sewerage drainage of the lower extremities vs. theory, we have only to consult the habits and dietetics peculiar to them, and in co-existant relation their symptomatic and transferred effects upon other organs and tissues. The podagra aberrans will illustrate in the flight of pain the parts implicated, which from characteristic effects directly indicate the cause of disease, and means to be adopted for the restoration of healthy action; and though the symptomatic wanderings can be traced the organs, ducts, and tissues surcharged in retention of matter to distentious inertia, which suspends the power of reciprocation in functional duty, and by over-taxing a class with vicarious action weakens the sequent correspondence necessary for the development and retention of health from equalized labor. The phlegmasia dolens of the ankle and lower leg, usually affecting women of middle and old age, with passive habits accustomed to a standing position with limited routine movements affording insufficient limb and general exercise for effective drainage, is another form of disease which becomes transferable from septic absorption. The primary characteristic symptoms indicate clearly the cause; and in the stage progress of the disease, from turgescence to dropsical ulceration, and its pari passu or sequent symptomatic varicose veins, can be traced the retention and presence of vitiated matter, that becomes for varying periods local, from its disorganizing effect upon the radiating vessels for venous distribution, which renders them powerless, in an increasing degree, to overcome the pressure of gravitation, that opposes the systole reaction of the heart and arteries upon the veins for the return current to its source of re-oxygenation. All of the diseases of the extremities in their acute inception, and until chronicism determines the nature, seat, and extent of the parts involved, reflect back to the mouth only symptomatic impressions without distinguishing features to determine more than that blood deterioration from resulting absorption of veins, introduced or generated from the retention of morbid matter, is the source of irritation. But, when in reaction the septic position reaches in accumulative process a vital organ, as the heart or lungs, with sufficient force to inoculate their tissues beyond the power of self-recuperation, in their special vocation of re-oxygenation, the valvular system of the fauces becomes affected from defective reaction of the blood, from the former's impaired action; and if the pulmonary system is the direct seat of the decomposing taint, the passages to and from the mouth become the drains of excretion. Even, the brain so essential to all the voluntary emotions of will dictation,—in secondary degree a dependant vital organ,—conveys its physical impressions of condition in confused symptomatic reflection through the avenues of the senses, to the adjuncts of the mouth, rather than by direct tissue influence; and can sustain for varying periods, hardening, softening and actual suppuration of one or more of its constituent parts without making its stage degrees of diseased progress distinctively manifest. But, although there are undoubtedly distinct evidences of reaction upon the mouth tissues, giving special indication of location and variations of disease, they have become so complicated from hereditary transmissions and malformations, that the impressions of organic and functional disturbances are so faintly shadowed that conjecture must enter largely into a diagnosis predicated entirely upon their symptomatic mouth demonstrations. In gout, when the gravitation drain has become obstructed to the knee, involving the passages and tissues of the joint, causing the absoption of the bursa mucosæ, oppression of the heart's action speedily follows from engorgement and loss of ventricular contractile power, the first effects in the series which foreshadow sudden death.

At this stage, the derangement of the valvular condition of the fauces becomes in a marked degree conspicuous, showing the intimate relation of their dependency, for integrity and promptness of action, upon the tonicity of the lungs and heart for the necessary elaboration and distribution of the blood. Phlegmasia dolens, in contradistinction to gout, has not an hereditary claim in transmission to either abundance or richness of diet as a latent cause of pre-disposition, but is rather an heir-loom inheritance of poverty and impoverished blood with entailed labor beyond the healthy powers of endurance.

The former disease having its origin in the generation of a specific obstruction, in generality begot of torpidity from engorgement or over-distension of the digestive, chyliferous and blood distributing vessels, and in cases of aggravation to peculiarities in food constituents or method of preparation. As in war, the rank and file of poverty are the common food of epidemics and diseases, self-generated from insufficient nutriment and laborious habits of exposure; while the rich in their exemption from necessity, create for themselves a class of obstructive diseases, that makes a bare competence gained with prudent discretion the reasonable allotment for the majority in life as a guard against the temptation to indulgence; but unfortunately the poor consider labor the curse of their condition and cultivate habits which render them slaves to their passions, and subject tools—with the snarling protest of self-imposed imbecility—to the controlling power held by the possessors of riches.

With these leading observations upon diseases subject to actual transfer, and those which are in fact only translated through septic taint forced to react upon the system from the obstruction of natural drains, which in free functional duty have hitherto passed unnoticed and unrevealed, other than by the general term of lymphatic vessels, it will be apparent that the mouth as the speaking centre of the adjunct senses, and symptomatic indicator of the entire organization, enacts directly and indirectly a very important part in fulfilling the conservative duties of commissary guardian, under brain control, for the selection and preparation of nutriment best adapted for the support of the animal economy in a healthy condition. It will also be equally clear to the educated perception, that the teeth of themselves, hold the same relation to the individual possessor that the millstones of the mill perform for the community at large; and can be substituted with artifical without serious detriment to the organic functions of the body. This, however, may be accounted an additional proof,—in negative operation—of man's superiority over the lower orders of animal life, who have neither the perfection of mouth adaptibility, *or necessity*, when free from human control, for artificial dentures; while at best the dentist only performs the service of a millright, and is no more worthy of a title for professional distinction, unless he makes the relations of the mouth with the rest of the system his study, and is able to take rational cognizance of its symtomatic phases of disease both direct and in reversion.

The method adopted by Miss———, a practitioner of dentistry in a prominent Russian city, for the eradication of an osteo-sarcomic tumor, and treatment of the diseased bone, will illustrate the importance of a full understanding of the anatomical, physiological, and pathological relations that exist between the mouth and the rest of the system. The essentials of her relation will attest to her natural and acquired ability, as well as to the delicacy and refinement of her disposition while enacting her part in a profession repugnant to the inborn instincts of woman; the adoption of her narrative style exultant in success, should not detract from its interest. Although addressed in personal confidence to the writer, its publication, from the important bearing its exhibits in extension from the simple mechanical treatment of the teeth will serve as a plea for his exculpation from a course which might otherwise be rated as a breach of trust.

——* * *——, Io triumphe! Permit me, my dear——, the privilege of using this excellent expression of joy on mutual account for a success which I hope you will think merited from the course I adopted to attain it; and pardon narrative prolixity, for in terse medical phrase I could not do justice to, or express my admiration for the rare qualities of mind possessed by my patient. But alas! that misled and misused she should feel anxious that the bitter experience of her life shall prove a warning to others; and it is with her permission and expressed wish, that with opportunity, I should make known and in no way extenuate the causes of her disease; for the distinction she has gained by her talents, wit and generosity, will prove more attractive for acquirement than the fear of her penalties will deter from a like course. Even with her proviso request, that I would only use her wayward name known to the public, curiosity will, if disposed, soon ferret out her real history and blazon it to the world with the insinuation of motives foreign to the natural instincts of her nature. Then I urged that silence with regard to name was the better policy of the medical attendant, she acknowledged a piquant curiosity to learn the very result I judged would prove so repugnant to the sensitive nature of a modest woman. But, probably, noting the shadow of disappointment that I could not repress from the expression of my face, she urged that otherwise the intelligent, whose good opinion she fondly cherished, might think she still lacked the discretion of refined delicacy that would be the natural proof that she possessed innately the qualities of judgment necessary to make the punishment she had received for the transgression of nature's laws useful, from sincerity of intention. To proceed in train; on the 5th of January '81, I received, at my operating rooms, a note from a lady of high rank, well-known to me from her reputation of being the most courtly and wittiest woman of the day in Europe, desiring a professional appointment for the evening. I was about to answer that gaslight was not suited for dental operations when it occurred to me that she was undoubtedly well acquainted with all the usages and mechanical requirements of the art, and probably had some other motive in view for the engagement. With this timely thought I named an hour most likely to suit her habits, and she was announced prompt to the minute, and for the unfashionable punctuality apologized by saying that it was caused by the selfish anxiety of fear; but instead of stating its source, and the nature of service required, with seeming Yankee avidity, as if anxious to adapt herself to the national peculiarities of my nativity, she gradually led the conversation, with an inquiring disposition into the bias transplanted from ancestral impressions, and when I stated that my mother's parents were natives of Ireland and my father's of New England she gave me, with a look of surprise, a keen scan of scrutiny. When she had taken an impression of my external miscegenic bearings she drew from me a relation of the habits of my childhood and the method adopted for my education. It was with a feeling tinge of self-depreciation that I acknowledged that my preliminary education was derived solely from parental tuition, and medical and dental from your instruction yet I could perceive that it rather strengthened than abated the respectful warmth of her attention, and after commendation of my judgment, which she said denoted from its clearness the encouragement of thought from single leading instructive suggestions, instead of the diverse theoretical teachings of the schools. You may be sure, that with all my unworthiness, and the thought that her judgment must be partial, even with the interested motives that prompted her to test my natural and acquired ability, I felt flattered with the evident favorable impression I was making, which the cynical wag of your nose will not altogether abate.

To be Continued.

ARTICLE III.

A HISTORY OF "THE PRINCIPLES AND PRACTICE OF DENTISTRY."

Including Anatomy, Physiology, Pathology, Therapeutics, Dental Surgery and Mechanism.—By Chapin A. Harris, M. D., D. D. S. Eleventh edition. Revised and edited by Ferdinand J. S. Gorgas, A. M., M. D., D. D. S., author of "Dental Medicine," Professor of the Principles of Dental Science, Dental Surgery and Dental Mechanism in the University of Maryland. With two full-page plates and 744 other illustrations. 994 pages. Octavo. Cloth, $6.50; Leather, $7.50. Philadelphia: P. Blakiston, Son & Co., 1885.

[From the April No. 1885, of the *Independent Practitioner*.]

"The publication of the eleventh edition of the oldest of our standard text-books demands something more than a passing notice. It marks an era in our professional literature. We use the term advisedly and after due consideration, for the last decade has witnessed such an advance in the knowledge upon which an intelligent practice if founded, that its first crystallization into our permanent literature may well be considered as a distinctive epoch.

To Chapin A. Harris is universally conceded the position of Father of Modern American Dentistry. He did more to give it its distinctive character, to mark out its future course, to mould and fashion it into what it is to-day than any other man. That American Dentistry differs from the dentistry of any other country, is mainly due to his writings and teachings. When medical schools were closed against the teachings of dental science, Harris, with his coadjutors organized an independent college, instituted a new and peculiar degree, and launched dentistry in its own bark. Under the peculiar circumstances of the time there was no other course to take, if we were not to degenerate into mere handicraft.

The first edition of The Principles and Practice of Dentistry was published by Dr. Harris in 1839, the same year in which he founded THE AMERICAN JOURNAL OF DENTAL SCIENCE, the first dental journal published, and one year before he established the first dental college in the world

It was a thin, octavo volume, with but a few illustrations but it very fairly represented the then infant science of dentistry. Although conducting a large private practice, he was constantly engaged in literary work. The publishing of books and journals was not then reduced to a kind of science, as it is to-day, and for many years Dr. Harris was his own publisher. He conducted his private practice, wrote and published books, and edited, and a part of the time published, a monthly journal. How would he have regarded some of the men of to-day, who, with a practice no larger than his own, and nothing else to occupy their time complain that they have not the necessary leisure for even reading dental journals, to say nothing of a comprehensive study of the literature of their profesion.

The second edition of one thousand copies of this work was, by agreement with Dr. Harris, published in

Philadelphia, in 1844, by Lindsay & Blakiston, the predecessors of the present publishers. This edition contained many new illustrations, and was considerably increased in size and comprehensiveness. The third edition, of the same number of copies, was published in 1847. The fourth edition, of one thousand copies, was published in 1850. The fifth, in 1852; the sixth, in 1855; the seventh, in 1858; the eighth, in 1863; the ninth in 1866. Each of the last five of these editions consisted of fifteen hundred copies, and each was more or less revised and enlarged to meet the rapid advances made by the growing science.

Dr. Harris having died in 1860, and the status of the profession demanding that the work be thoroughly revised and enlarged for the ninth edition, Dr. Philip S. Austin, now deceased, was selected to do the work. He was assisted by Prof. F. J. S. Gorgas in the departments of pathology and surgery, and by Dr. Thomas S. Latimer in anatomy and physiology. Each of these men had been associated with Dr. Harris as a teacher in the Baltimore College of Dental Surgery, and under their joint care the tenth edition, of which five thousand copies have been sold, was issued in 1871. Very much of the work was entirely rewritten, and considerable additions were made to the text.

This edition sufficed for the wants of the profession for some years, but as the copies upon the shelves of the publishers gradually disappeared, it became evident that yet another addition must be prepared. Since the publication of the tenth edition, wonderful advances had been made in some of the fields of dental science. The histology of 1870 had become a thing of the past. Recent discoveries, by careful observers, had shown that some of the teachings of the tenth edition were erroneous. In pathology the advances had been most marked, and the book had, even in the few years that had elapsed, become almost antiquated. The teachings of 1870 would not answer for 1880, much less for 1885. In Mechanics and prosthesis the change in practice had not been so marked, but even here careful revision was neccessary. The work of preparing the new edition was entrusted to Prof. F. J. S. Gorgas, one of the editors of the preceding edition, as the man best qualified in all respects for the labor, and the consequence is a book that may almost be called a cyclopedia of dental practice. So great is the contrast with the tenth edition, that it may be considered practically a new book. Much of the matter in the old edition has been struck out as obsolete, or erroneous, yet so large have been the additions that the new work exceedes the size of the old by two hundred pages. Four hundred new illustrations have been added, and many of these are the most valuable that the work contains. To-day, Harris' Principles and Practice is is the most complete text-book known to the profession.

In addition to the sale of the former editions in this country, the book has received a large and steady demand from the profession in England, and it has been translated into French. Including the present edition, eighteen thousand five hundred copies have been printed, a most unprecedented sale for a work of this character. The amount paid in royalties to Dr. Harris and his heirs has amounted to a very large sum, and the copyright money is still paid them.

In writing this sketch of his principal work, it may not be amiss to include a few facts concerning the honored author, for every dentist should know something of the life of one so prominent in his profession.

Chapin A. Harris was born at Pompey, Onondaga Co., N. Y., in 1806. He graduated in medicine in 1830, and for a few years was a general practitioner, when he turned his attention to dentistry. Besides his continual contributions to the AMERICAN JOURNAL OF DENTAL SCIENCE, he wrote a "Dictionary of Medicine and Dental Surgery," of which five editions have been published, and he translated from the French a number of works of importance. He died in September, 1860, at the age of fifty-four, from a disease contracted through overwork.

When we set out to write this notice, it was with the intention of presenting a digest of the contents of the eleventh edition of Dr. Harris' great work, and to this end copious notes were made during its examination, and it was carefully compared with the ninth and tenth editions. But limited space forbids the pursuance of this plan, nor is it necessary. It is sufficient to say that the book is brought up fully abreast the advance of thought, and to-day we may take an honest pride in the fact that dentistry possesses such a text-book. Instead of the teachings of Goodsir, and Robertson, and Bell, we have the later discoveries and observations of Kolliker, and Waldeyer, and Miller. In every department it is made complete, and in harmony with the most modern accepted theories. It is an essential in the library of every dental student, and is quite as necessary to the possessors of the earlier editions as to those who have never seen them.

It is needless to say that the publishers have done their full duty, and that the letter press, illustrations and binding, are perfect of their kind.

[From the *Dental Cosmos*, March No. 1885.]

The first edition of this book was published in 1841; the last (tenth) edition was issued under the editorship of the late Dr. P. H. Austen.

Nearly fourteen years having elapsed since that revision, the rapid advances made during that period have necessitated another, which, as stated in the preface, was undertaken by Prof. Gorgas at the request of the publishers and of the author's family, involving, as he claims, more than a year's labor. Many changes have been made in the arrangement of topics; new chapters have been added; the number of illustrations has been greatly increased, and much that had become obsolete in theory and practice has been omitted.

Of the omissions, it is only necessary to say that good judgment has been exercised in expurgation.

Of the many valuable additions, the most considerable are under the heads of irregularity of the teeth, preparation of natural roots for attachment of artificial crowns, and vulcano-plastic work; but many other notable and valuable additions have been made through-out the volume.

The book is divided into four parts, treating respectively of anatomy and physiology, pathology and therapeutics, dental surgery, and dental mechanics. The literature of the profession has evidently been diligently searched, and we can scarcely recall a plausible theory which has been suggested, or an improved appliance or method which has been devised, within the last decade, that has not received more or less notice by the editor. There has evidently been an earnest and conscientious effort to incorporate in this volume all that belongs to a text-book of dentistry. It is sufficiently elementary for the student, while at the same time a reliable guide to the practitioner.

This new edition of Harris is so far ahead of all previous editions that it should be in the possession of every dental student, and there are few practitioners who can afford not to number it among their possessions.

It would not be difficult to criticise some of the teaching. No volume of this extent was ever written which was not open to criticism, and none such will ever be written that, in all respects, will find indorsement by any one individual. But, in the main, the instruction conveyed is reliable, the methods taught are such as are approved by some at least of those who are considered as authorities: and, until the times comes when all authorities shall agree upon all points, universal indorsement is not to be expected. We think, however, that all unprejudiced readers will admit that the eleventh edition of Harris is a volume of which the dental profession may not feel ashamed.

DR. B. H. CATCHING, editor of *The Southern Dental Journal*, April No. 1885, writes as follows concerning the new edition: "Dr. Gorgas has added greatly to the value of the work." "It now comes to us fully up to the present status of the profession." "The work as now revised stands far in the lead of any other work on dentistry," Dr. Gorgas spent a year's hard work in accomplishing what to any mind was a difficult undertaking. "That he has done his work well is evident, and an appreciative profession will accord him all praise." "As the work stands it is the text book for the student and a guide to the experienced." "Every library should have a copy of this new edition."

The following appears in the *Archives of Dentistry*, May No. 1885, from Dr. C. W. Spalding, editor.

"To say that this edition is greatly superior to either of its predecessors, is to only do simple justice to the editor. The laborious task of revising this large volume has in the main been well done and the result is highly creditable to the head and hand that has done the work." "The publishers have done their part and all concerned in the production of this eleventh edition of Harris deserve the sincere thanks of both students and practitioners."

Dr. George Watt, editor of the *Ohio State Journal of Dental Science*, writes as follows in the May No. 1885. "This splendid book is undoubtedly *the* work on modern dental practice and reflects great credit on its editor—we are tempted to say author, for it is virtually a new work by Prof. Gorgas." "We have carefully examined the thousand pages and find little or nothing in them to criticise." "Every reader of the *Journal* should own a copy for reference, if not for study."

ARTICLE IV.

AT WHAT AGE TEETH SHOULD HAVE THE MOST ATTENTION.

BY DR. GEO. A. MILLS, BROOKLYN.

I regard the time between the ages of fifteen and twenty-one, particularly in young ladies, as the most critical period we have to deal with. Young girls passing through the age of puberty are in an extremely sensitive condition of body and mind, and that has a great deal to do with directing, and causing divergence in all the operations of growth and repair. It is a period in which we should be very careful and work understandingly, for we can be the means of doing much mischief. I speak more particularly of young girls. Boys are bad enough. The whole matter of the treatment of children's teeth is something we ought to be patient about and discuss fairly, for on it lies the ultimate success of our practice. If it is admitted that every divergence from nature's laws causes irregularity, disturbance and harm, should we extract the temporary teeth? The careless extraction of the temporary teeth, as well as of the permanent, is doing great harm. I question somewhat the idea of feeding the teeth. There may be something in it that I do not understand. I am greatly averse to the feeding of meat to children. Particularly with the American people, I think we are feeding too much animal food. I am acquainted with several persons who are vegetarians in the extreme sense of the word. I often notice these persons, and I find they are what we call conservative men, and that they have a higher standard of organization. But if you are going back to follow out nature's laws, you must go clear behind the growing child into the germinal matter. The sexual relation is a large and important question. The most eminent neurologists in this country are settling down on one general principle, that all diseases have their origin in nervous degeneracy. We must go back and look this thing in the face. The time is coming, perhaps, when those who come after us will understand this better than we are able to do. One thing in this connection is settled,— more highly organized beings are subject to a greater degree of deflection from outward circumstances than lower organizations. We know that in this country, there is a high state of nervous organization among the people, that there is all about us, and in all circumstances, a high-pressure condition largely due to nervous causes. Now, a very large proportion of the children born are generated under these conditions of nervous deflection. Take the germinal matter, the spermatoza, in a highly nervous organization, and we know very well that this germical matter is very far from being in a normal condition. It is subject to the pressure of its atmosphere, and the condition, of this germinal matter and the circumstances under which the child is generated have very much to do with the condition of its mind and body in the future. A great many people in the community are little more than bundles of nerves; and their trouble commenced nine months before they were born. There are marked instances on record of difference in children who were generated by the same parents under different circumstances. It sometimes occurs that the first child is the best child, and sometimes the last child child is the best child.

Now, the reason some are better than the others is that they were conceived under more favorable circumstances. When the progenitors are first married is one of the happiest and most favorable periods for generating well-organized children; they are under new relations of life, generally in good health, filled with all kinds of hopefulness, everything is lovely, and children conceived under such circumstances are likely to be well organized. But go farther along in life and the time comes when there is an adverse change in the circumstances of the parents, financial embarrassment, excessive toil, and many cares harass them, and the children then generated reflect the change in circumstances. Children generated during times of financial crisis, when there is commercial disturbance from top to bottom of society, with sudden loss of wealth and comforts, show a marked deflection from the normal condition, due to a like condition of the germinal matter in their progenitors, caused by sympathy with their changed circumstances. It is falling of the mercury, and the children, when born, are absolutely certain to evidence it.

Consider the man who is not married till he is forty years of age, and then begets children. This man is in a state of maturity, and the children generated under such circumstances are very often of an improved standard of organization. I remember a statement I heard a woman make once, which I thought rather remarkable, as coming from a woman, that when we get to the point were children are properly generated, they will never need any regeneraation. The meaning of this is, that when we understand nature's laws and conform to them, when everything is working in harmony, then we get a high state of organization, spiritual as well as animal. Nothing can be truer than this. We are passing through a transition state; the animal and the spiritual in us are struggling with each other.

Go back to the pre-historic ages, when the race lived more on the animal side,—more animal and less spiritual,—and you see, as shown in the skulls belonging to that period which are preserved in our museums, a firstclass type of teeth.

In the skulls of the Romans you see a very perfect development of teeth. Then there was a deflection from this standard, and you see in the skulls of those ages the types of all the dental diseases which we see to-day—caries, necrosis, alveolar abscess, etc. We must be patient, striving for what is possible, not for what we would like to be, and encouraging the youngmen who are coming to take our places. As we get on a higher plane of civilization, where nature's laws will be understood and observed, we shall more clearly see that prevention is better than cure.—*N. J. Dental Society*

ARTICLE V.

KANSAS STATE DENTAL LAWS.

AN ACT.

To regulate the practice of dentistry, and punish violators thereof.

Be it enacted by the Legislature of the State of Kansas:

Sec. I. That it shall be unlawful for any person to practice or attempt to practice dentistry or dental surgery in the State of Kansas, without first having received a diploma from the faculty of some reputable Dental College, School, or University Department, duly authorized by the laws of this State, or some other of the United States, or by the laws of some foreign government, and in which College, School, or University Department, there was at the time of the issuance of such diploma, annually delivered a full course of lectures and instructions in dentistry or dental surgery.

Provided, That nothing in Sec. I of this Act shall apply to any person engaged in the practice of dentistry or dental surgery in this State at the time of the passage of this Act, except as hereinafter provided.

And, provided further, That nothing in this Act shall be so construed as to prevent Physicians, Surgeons or others from extracting teeth.

Sec. II. A Board of Examiners, consisting of five practicing dentists, residents of this State, is hereby created, who shall have authority to issue certificates to persons in the practice of dentistry or dental surgery in the State at the time of the passage of this Act, and also to decide upon the validity of such diplomas as may be subsequently presented for registration, as hereinafter provided.

Sec. III. The members of said Board shall be appointed by the Governor, and shall serve for a term of four years, excepting that the members of the Board first appointed shall hold their offices as follows: Two for two, and three for four years respectively, and until their successors are duly appointed. In case of vacancy occuring in said Board, such vacancy shall be filled by appointment by the Governor.

Sec. IV. Said Board shall keep a record, in which shall be registered the names and residence or place of business of all persons authorized under this Act to practice dentistry or dental surgery in this State. It shall elect one of its members President, and one Secretary thereof, and it shall meet at least once in each year, and as much oftener, and at such times and places as it may deem necessary. A majority of the members of said Board shall constitute a quorum, and the proceedings thereof shall be at all times open for public inspection.

Sec. V. Every person engaged in the practice of dentistry or dental surgery within this State at the time of the passage of this Act, shall within six months thereafter cause his or her name and residence and place of business to be registered with said Board of Examiners, upon which said Board shall issue to such person a certificate duly signed by a majority of the members of said Board, and which certificate shall entitle the person to whom it is issued to all the rights and privileges set forth in Sec. 1 of this Act.

Sec. VI. Any person desiring to commence the practice of dentistry or dental surgery within this State after the passage of this Act, shall, before commencing such practice, file for record in a book kept for such purpose, with said Board of Examiners, his or her diploma, or a duly authenticated copy thereof, the validity of which said Board shall have power to determine. If accepted, said Board shall issue to the person holding such diploma a certificate duly signed by all or a majority of the members of said Board, and which certificate shall entitle the person to whom it is issued to all the rights and privileges set forth in Sec. 1 of this Act.

Sec. VII. To provide for the proper and effective enforcement of this Act, said Board of Examiners shall be entitled to the following fees, TO-WIT: For each certificate issued to persons engaged in practice in this State at the time of the passage of this Act, the sum of Three Dollars. For each certificate issued to the persons not engaged in the practice of dentistry at the time of the passage of this Act, the sum of Ten Dollars.

Sec. VIII. The members of said Board shall each receive the compensation of three dollars per day for each day actually engaged in the duties of their office, which, together with all other legitimate expenses incurred in the performance of such duties, shall be paid from fees received by the Board under the provisions of this Act, and no part of the expenses of said Board shall at any time be paid out of the State treasury.

All monies in excess of said *per diem* allowance, and other expenses, shall be held by the Secretary of said Board as a special fund for meeting the expenses of said Board, he giving such bond as the Board shall from time to time direct, and such Board shall make an annual report of its proceedings to the Governor by the fifteenth day of December of each year, together with an account of all monies received and disbursed by them in pursuance of this Act.

Sec. IX, Any person who shall violate this Act by practicing or attempting to practice dentistry within the State without first complying with the provisions of this Act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in a sum not less than Ten Dollars nor more than one hundred dollars for each offense. All fines recovered under this Act shall be paid into the common school fund of the county in which the conviction is obtained.

Sec. X. This Act shall take effect and be in force from and after publication in the Statutes.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.—The third regular meeting of the National Association of Dental Examiners was held in Tulane Hall, New Orleans, on Tuesday, March 31, 1885.

The State boards of Ohio, Indiana, Illinois, Michigan, Georgia, Louisiana, South Carolina, Kentucky, Mississippi, and Maryland were represented by the following gentlemen:

J. Taft and H. A. Smith, of Ohio; S. T. Kirk, of Indiana; A. W. Harlan and Geo. H. Cushing, of Illinois; J. A. Robinson and A. T. Metcalf, of Michigan; G. W. McElhaney and J. H. Coyle, of Georgia; J. S. Knapp, L. A. Thurber, O. Salomon, and J. R. Walker, of Louisiana; G. F. S. Wright, of South Carolina; A. O. Rawls, of Kentacky; A. A. Dillehay, R. J. Miller, W. T. Martin, and W. H. Marshall, of Mississippi; Richard Grady, of Maryland.

The greatest harmony prevailed in their deliberations, and after the fullest consideration the following resolutions were adopted.

Resolved, That this association recommends to all State boards of examiners that registration should be made with both the examing boards and the clerks of the county courts.

Resolved, That this association thinks that all examinaons of candidates by State boards should be conducted principally in writing, and that a record of such examinations should be kept by the secretaries of the boards.

Resolved, That, in the opinion of this association, a diploma from a reputable dental college should be considered as the only evidence of qualification for those who seek in the future to enter the dental profession, and that we recommend to all State boards to secure, at the earliest practicable moment, the amendment of existing laws so as to attain this end.

Resolved, That the appropriation, by any person, of any title or appellation to which he is not justly entitled and by which deception and fraud may be practiced is, in the opinion of this association, highly reprehensible, and should be prohibited by legal enactment.

Resolved, That this association deems it undesirable that State examining boards should be composed of gentlemen serving as professors in dental colleges, and recommends to the appointing powers of all States that, so far as may be possible, the places of such professors, when their terms of office expire, be filled by those not holding such positions.

The association adjourned to meet in Minneapolis on the first Tuesday in August, 1885.

GEO. H. CUSHING, *Secretary.*

EDITORIAL, ETC.

THE INTERNATIONAL MEDICAL CONGRESS.—The organization of the Section of Dental and Oral Surgery of this Medical Congress, which meets in Washington City in 1887. Ninth Session, and of which Professor John S. Billings, M. D., of the Johns Hopkins University and the U. S. Army, is Secretary General, has been completed by the appointment of the following gentlemen:

President.—Jonathan Taft, M. D., D. D. S, Cincinnati, Ohio:

Vice President.—W. W. Allport, M. D., D. D. S., Chicago, Ill; William H. Dwinelle, M. D., D. D. S., New York City; J. L. Williams, M. D., D. D. S., Boston Mass.

Secretaries.—E. A. Bogue, M. D, D. D. S., New York City; Geo. H. Cushing, D. D. S., Chicago, Ill.

Members of Council.—W. C. Barrett, M. D., D. D. S., Buffalo, N. Y; Thos. Fillebrown, M. D., D. M. D., Portland, Me; F. J. S. Gorgas, M. D., D. D. S., Baltimore, Md; Edw. Maynard, M. D., Washington, D. C; J. H. McKellops, D. D. S., St. Louis, Mo. W. H. Morgan, M. D., D. D. S, Nashville, Tenn; C. N. Pierce, D. D. S., Philadelphia, Pa; L. D. Shepard, D. D. S., Boston, Mass; Jas. Truman, D. D. S., Philadelphia, Pa. James W. White, M. D., D. D. S., Philadelphia, Pa.

GEN. GRANTS DISEASE.—The *Medical Record* of the 24th. of April last gives the result of an examination as follows:

"The microscopic examination of the specimen removed from Gen. Grant's throat has declared the disease to be epithelioma. But epithelioma, barring accidents from complications, is not a very rapidly progressive disease. It may continue for months, slowly eating its way into surrounding tissues without of itself killing the patient. The progress of the throat trouble, under well-recognized methods of treatment, has thus far not been such as would lead physicians to believe that the microscope was in error in confirming the original diagnosis."

Prof. Frank Abbott, M. D. of New York City, in an article published in the *Independent Practitioner*, April No. describes the condition of Gen. Grant's mouth on the 8th, of November 1884, from an examinotion made by him at the request of Dr. Fordyce Baker. The right ripper first molar was found to be dead, with an abscess at the apex of the anterior buccal root, it was considerably projected from its original position, and the neck and one half the length of the roots were covered with tartar. This tooth was removed, and the relief from pain was highly satisfactory. An examination made by Dr. Abbott on the 14th, of the same month showed the second and third right superior molars to be projecting from a quarter to three eights of an inch, the necks and two-thirds of the length of their roots being thickly coated with tartar, of a dark brown or black variety, the sockets being almost entirely absorbed, while the teeth were very loose. The second molar was very badly decayed, the side wall broken down, and the pulp dead. The surrounding gum was very much irritated, the inflammation extending to the roof of the mouth and back into the fauces. These teeth were removed and the tartar cleaned from the other teeth in the mouth. Dr. Abbott also says that the side of the tongue had been constantly rubbing against the rough and ragged surfaces of the broken tooth and the tartar incrustations, and the inflammation had extended into the vault and down that side of the patient's throat, and he very reasonably concludes that "here may have been a factor, at least, in the localization of the painful disease from which the General is now suffering, instead of attributing, it altogether to the habit of smoking, which seems to be the prevailing opinion, at least among the laity."

An examination with an illumating apparatus on the 25th, of April last, is described as follows in the New York papers.

"The state of the General's throat being such that he could not open his mouth wide enough to admit of the old instrument, the new one was put into operation for the first time in this country. It consists of a dynamo generator, worked by a crank and a tongue depressor and incandescent lamp in one. The view of the General's throat under the new light revealed a very discouraging state of affairs. The gums are honeycombed and for a distance down the uvula presented the appearance of a red rough surface covered with mucus. To to this is attributed the pain and uneasiness which the General has been suffering from for the last few days. It was the opinion that the doctors have made no mistake in their diagnosis and that the General's case is a hopeless one, and that the General's was such a critical case that no definite opinion can be given of it."

MONTHLY SUMMARY.

THE REMOVAL OF STAINS FROM THE TEETH CAUSED BY ADMINISTRATION OF MEDICINAL AGENTS AND THE BLEACHING OF PULPLESS TEETH.—*By A. W. Harlan, M. D., Chicago, Ill.* (*Read in the Section of Oral and Dental Surgery of the American Medical Association, May,* 1884.)—GENTLEMEN—A large number of remedial agents administered by physicians temporarily stain the teeth, but in looking over the list I find there are but few which may be said to permanently stain them. The mineral acids—nitric, sulphuric, hydrochloric, and other acids of this nature, if used for any length of time, may discolor the teeth and likewise have a deleterious effect on them; yet it cannot be said that such agents stain the teeth so that any particular method should be desired for restoring their natural appearance. The vegetable series may likewise be dismissed. The tannates and astringents generally do not permanently stain the teeth. The muriated tincture of iron, and in fact all the ferrum preparations, with the single exception of ferrum dialystum, do stain the teeth; yet it is comparatively easy to remove such stain, by the use of dentifrices and tooth pastes, when of recent occurence. Occasionally it may be necessary to polish the teeth with wooden or leather points charged with finely pulverized emery or levigated pumice; following these, powdered Arkansas stone and precipitated chalk, incorporated with a thick solution of white castile soap, should be used. The stains produced by hydrastis, aloes, tobacco, rhubarb, ink, infusion of saffron, pinus canadensis, carmine, catechu, hydriodic acid, tincture of iodine, and kindred agents, are of temporary duration in nearly all cases. Not so with tobacco, when the enamel has been fractured, or the masticating surfaces of teeth have been deprived of their enamel by wear. In such cases there is no remedy for the stain, when it disfigures, except to cap the teeth with gold. This last condition it is seldom found necessary to treat, as in such cases generally it is only imperative when the ends of the teeth have become sensitive to thermal change. Staining of the teeth as a result of age, it is not the province of this paper to treat. The single substance, which I have found to stain the teeth permanently, is nitrate of silver. Solutions are frequently used in the mouth and throat of too great strength. Many times the powdered nitrate is used to dust diseased mucous membranes, and the teeth then suffer. Occasionally, dental surgeons use the solid stick on the walls of sensitive teeth, and also to arrest incipient caries. When carelessly used it may stain other teeth than those operated upon. These cases are the ones we are called upon to treat. It matters not how the stains are acquired, they must be removed, and no amount of polishing, without injury to the external surfaces of the teeth, will remove such stains. The agents which may be used for removing such stains are not numerous. Cyanide of potassium, iodide of potassium, tincture of iodine, and the liq. amm. fortior are all recommended. There are other substances which may be used to remove fresh stains, notably solution of chloride of sodium if used immediately. I recommend as the neatest, safest, and most certain method, the adjustment of the rubber dam; then dry the teeth, and paint three or four of them with the compound tincture of iodine, allowing it to dry; then moisten the surfaces of the teeth with the stronger liquor ammonia for two or three minutes, and wash the surfaces with peroxide of hydrogen. The stains will have disappeared in consequence of the chemical change having taken place resulting in the formation of iodide of silver and nitrate of ammonia. The teeth should then be polished in the usual manner.

BLEACHING TEETH.

It is not intended that a history of various methods of bleaching teeth in use should be presented for consideration at this time; but it is necessary to remark that most of them are faulty and very few useful in all cases. In order to bleach a pulpless tooth the operator must first fill the root at least one-third its length. All decay should be removed and the fragments of the pulp in the fine angles of the outline of the living pulp should also be removed. Discolored dentine if hard need not be cut away. With the rubber dam adjusted over the adjacent teeth, including the one to be operated upon, the cavity is thoroughly washed with $H_2 O_2$ repeatedly and then carefully dried by using the hot blast from a powerful bulb syringe. A small quanity of choride of alumina is placed within the cavity, and it is moistened with peroxide of hydrogen and allowed to remain five minutes. The deliquesced $Al_2 Cl_6$ is carefully washed out of the cavity with a clear solution of sodæ biboras $Na. 2, B_4 O_7 \cdot 10 H_2 O$, and the cavity thoroughly dessicated. In the vast majority of cases the tooth will have returned to its normal color. The cause of the change in color is owing to the complete oxidation of the infiltrate into the tubules and the destruction of the staining of the contents of the tubules. The tooth should not be bathed in creosote, carbolic acid, alcohol, or any other substance capable of coagulating albumen. Where the operator has reason to suspect that any such agent has been introduced into the cavity, it should first be washed with the clear solution of sodæ biboras, and then followed by the above-mentioned method. The rapid liberation of chlorine from Al_2Cl_6 in the presence of H_2O_2, resulting in the formation of H-Cl and H_2O, leaving unsatisfied O and Cl accounts for the speedy destruction of the coloring matters within the pulpless tooth. In order to maintain the color an oxy-chloride of suitable color should be used to fill the remainder of the pulp canal, and as large a portion of unfilled cavity as judgment will indicate; thirty to fifty minutes should be given for the hardening of the oxy-chloride. The cavity should be filled with gold immediately. It is not wise to allow saliva or other liquids to come in contact with the oxy-chloride after it is introduced into the tooth. It jeopardizes the permanency of every case when oxy-chloride becomes moist, on account of the speedy absorption of fluids by the freshly hardened filling.

CHOICE OF TEETH FOR EXTRACTION FOR THE PURPOSE OF UNIFORMITY.—The physician is not always consulted relative to the best course to adopt in regard to the teeth, but he cannot afford to be ignorant of the peculiarities of this important part of the anatomy. When the teeth are too much crowded in the jaw, it is frequently desirable for æsthetic and hygienic purposes to draw some of them, and the question which to draw when there is a choice has, it appears been a constant source of discussion among dentists. Dr. Perry, in order to throw some light on the subject, has tabulated 7,277 extractions for disease, and finds that 2,823 of these were first permanent molars, 737 were first bicuspids, and 944 were second bicuspids. As the statistics show that more first molars are lost than bicuspids, we should, as a general rule, take out the first molar were the choice must be, as is usually the case, between this and a bicuspid.—*The Weekly Medical Review.*

JAPANESE TEETH.—Before the Odontological Society of Great Britain (Dec. 1, 1884), Dr. St. George Elliott exhibited and presented to the museum some very curious artificial dentures of Japanese manufacture. These people had derived most of their technical and scientific knowledge from the

Chinese, but, in this matter, they were far in advance of their teachers; for, whilst the latter could only carve a row of incisors and fasten them to the teeth on either side, the Japanese could make thoroughly serviceable dentures, and had been acquainted with the method of fixing them by suction for about two hundred years. The teeth were mounted on hard wood, those in front being made from quartz pebbles carefully ground down, but the process of mastication was performed by copper nails which occupied the place of the molars. One of the dentures had been in use for fifteen years. Dr. Elliott gave a very interesting account of the way in which they were made and fitted.

THE HYPODERMIC SYRINGE.—*By J. S. Geigley, M. D., Lewiston, Ill.*—In Dr. Bumstead's communication to the Clinical Society, in the last number of the MONTHLY, he made some observations on hypodermic injections, and, as this is a matter that is not very frequently discussed, I think I may be pardoned for delivering myself of a few thoughts on the subject. I've often been surprised at the ignorance or carelessness manifested in the use of this little instrument by many physicians, men, too, who were capable and acute in other things, but who seemed to have failed to become thoroughly acquainted with an instrument that is so potent for good, when judiciously used. For my own part, I should feel utterly helpless without a good hypodermic syringe, in the treatment of some of the more malignant malarial affections which we often meet along the river bottoms, not to say anything of the innumerable *algias* over which the hypodermic syringe exerts such a magical influence.

Now what are the requirements for success with the hypodermic method? First of all, we must have a good instrument, the different parts of which should fit so accurately as not to admit of the loss of a single drop of the solution, except through the needle. The piston should fit closely, but not tightly. A good test for a syringe is to withdraw the piston while stopping the opening at the other end with the finger. If the piston rebounds on being released, the instrument can be relied on. Now, next comes the needle. A good needle is everything, while a poor one is an abomination. If I were given my choice between a good syringe with a poor needle and poor syringe with a good needle, I should choose the latter every time, for I should be much more confident of getting my solution in the right place with it. The needle should be of good size, and not too long. A large needle gives no more pain than a small one, and does not become clogged so easily. The point should be perfectly sharp, with no rough edge, and should have the very slightest bend in the direction of the bevel. An elegant needle has lately been placed on the market, under the name of the "re-enforced hypodermic needle." Now as a good instrument might be rendered worthless in a short time by not having the proper care, perhaps a few words on that subject would not be out of place.

The piston should be occasionally removed from the barrel, and the packing thoroughly cleaned and oiled. It is always well enough to keep a drop or two of water above the piston. This keeps the leather from shrinking if the instrument is not used for several days. Always after using the syringe the needle should be thoroughly cleansed. This is important, for two reasons—first, it preserves the potency of the opening and keeps the needle in good order; second, it might prevent infecting some one with a contagious disease. A little dilute acid first, and water afterward, drawn into the syringe, will accomplish the first and prevent the second. If a needle should become clogged so that the obstruction cannot be removed with the wire, or by soaking in dilute acid, it will be found to clear instantly if held in the flame of a spirit lamp, or even a match. True this will draw the temper of the needle, but it can be pretty well restored by plunging it in a glass of cold water, while at a red heat.

Now, as to the points of election for the insertion of the needle: For all ordinary drugs, such as solutions of morphia, atropia, apomorpea, pilocarpine, etc., the backs of the arms, anywhere from the wrists to the shoulders, are preferable on on account of being less sensitive and there being fewer vessels to run the risk of puncture. The same is true of the lower limbs, but, when irritating injections such as acid solutions of quinine, chloral, or ergot, are to be used, they will be found to give the least trouble if injected in the buttocks or on the backs of the shoulders. In hypersensitive persons, some kind of a local anæsthetic will be found useful. I have found that a small piece of ice pressed on the skin for a short time before making the punctures will answer admirably. Another point worth remembering, is, not to use too much strength in picking up the skin in which to make your puncture; for, in an individual with a delicate skin, an unsightly discoloration would be apt to follow, which would be annoying to the patient and embarrassing to the physician

Now, a few words in regard to the solution usually employed for hypodermic use, and I am done. These should, as a rule, be prepared as used; the compressed hypodermic tablets now on the market enable us to do this with little loss of time and perfect accuracy. If the solution is heated in a spoon over a lamp, before being drawn into the syringe, it will be rendered perfectly aseptic, and, as the solution is more perfect, it is less liable to create local disturbance.

In regard to the hypodermic use of the various drugs, I shall only refer to one specialty, and that is, quinine. In my opinion, five grains, in proper solution, of this drug, given hypodermically, will do more toward breaking up an intermittent or a remittent fever, than twenty grains will do if given by the mouth. Then, too, the cerebral disturbance will not be so great. There is a great saving of the drug. And we will not be depending upon a disordered stomach for the absorption of our quinine.

The solution I use is this:

Quiniæ sulph.,	5 grains.
Acid. tartaric,	2½ grains.
Aqua,	q. s. ad. 1 drachm.

This is to be boiled in a test tube over a spirit lamp, until perfectly clear. It will not precipitate on cooling, and, being quite dilute, will not cause abscess, and but very little pain. To break up an intermittent, I usually inject all of the solution, half in each shoulder, two hours before the expected chill. I treat neuralgia of malarial origin in the same way, only adding a quarter of a grain of morphia to the solution —*Peoria Med. Monthly.*

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ARTICLE I.

DISINFECTION AND DISINFECTANTS.

(Preliminary Report made by the Committee on Disinfectants of the American Public Health Association.

The object of *disinfection* is to prevent the extension of infectious diseases by destroying the specific infectious material which gives rise to them. This is accomplished by the use of *disinfectants*.

There can be no partial disinfection of such material; either its infecting power is destroyed or it is not. In the latter case there is a failure to disinfect. Nor can there be any disinfection in the absence of infectious material.

It has been proved for several kinds of infectious material that its specific infecting power is due to the presence of living micro-organisms, known in a general way as "disease germs;" and practical sanitation is now based upon the belief that the infecting agents in all kinds of infectious material are of this nature. Disinfection, therefore, consists essentially in the destruction of disease germs.

Popularly, the term disinfection is used in a much broader sense. Any chemical agent which destroys or masks bad odors, or which arrests putrefactive decomposition is spoken of as a disinfectant. And in the absence of any infectious disease it is common to speak of disinfecting a foul cess-pool, or bad-smelling stable, or privy vault.

This popular use of the term has led to much misapprehension, and the agents which have been found to destroy bad odors—*deodorisers*—or to arrest putrefactive decomposition—*antiseptics*—have been confidently recommended and extensively used for the destruction of disease germs in the excreta of patients with cholera, typhoid fever, etc.

The injurious consequences which are likely to result from such misapprehension and misuse of the word disinfectant will be appreciated when it is known that:

Recent researches have demonstrated that many of the agents which have been found useful as deodorisers, or as antiseptics, are entirely without value for the destruction of disease germs.

This is true, for example, as regards the sulphate of iron or copperas, a salt which has been extensively used with the idea that it is a valuable disinfectant. As a matter of fact, sulphate of iron in saturated solution does not destroy the vitality of disease germs or the infecting power of material containing them. This salt is, nevertheless, a very valuable antiseptic, and its low price makes it one of the most available agents for the arrest of putrefactive decomposition in privy vaults, etc.

Antiseptic agents also exercise a restraining influence upon the development, of disease germs, and their use during epidemics is to be recommended, when masses of organic material in the vicinity of human habitations cannot be completely destroyed, or removed, or disinfected.

While an antiseptic agent is not necessarily a disinfectant, all disinfectants are antiseptics; for putrefactive decomposition is due to the development of "germs" of the same class as that to which disease germs belong, and the agents which destroy the latter also destroy the bacteria of putrefaction, when brought in contact with them in sufficient quantity, or restrain their development when present in smaller amounts.

A large number of the proprietary "disinfectants," so called, which are in the market, are simply deodorisers or antiseptics, of greater or less value, and are entirely untrustworthy for disinfecting purposes.

Antiseptics are to be used at all times when it is impracticable to remove filth from the vicinity of human habitations, but they are a poor substitute for cleanliness.

During the prevalence of epidemic diseases, such as yellow fever, typhoid fever and cholera, it is better to use, in privy-vaults, cess-pools, etc., those antiseptics which are also disinfectants—i. e., germicides; and when the contents of such receptacles are known to be infected this becomes imperative.

Still more important is the destruction at our sea-port quarantine stations of infectious material which has its origin outside of the boundaries of the United States, and the destruction, within our boundaries, of infectious material given off from the persons of those attacked with any infectious disease, whether imported or of indigenous origin.

In the sick-room we have disease germs at an advantage, for we know were to find them as well as how to kill them.

Having this knowledge, not to apply it would be criminal negligence, for our efforts to restrict the extension of infectious diseases must depend largely upon the proper use of disinfectants in the sick room.

GENERAL DIRECTIONS.

Disinfection of Excreta, etc.—The infectious character of the dejections of patients suffering from cholera and from typhoid fever is well established; and this is true of mild cases and of the earliest stages of the diseases as well as of severe and fatal cases. It is probable that epidemic dysentery, tuberculosis, and perhaps diphtheria, yellow fever, scarlet fever and typhus fever may also be transmitted by means of the alvine discharges of the sick. It is therfore of the first importance that these should be disinfected. In cholera, diphtheria, yellow fever and scarlet fever, all vomited material should also be looked upon as infectious. And in tuberculosis, diphtheria, scarlet fever and infectious pneumonia, the sputa of the sick should be disinfected or destroyed by fire. It seems advisable also to treat the urine of patients sick with an infectious disease with one of the disinfecting solutions below recommended.

Chloride of lime, or bleaching powder, is, perhaps, entitled to the first place for disinfecting excreta, on account of the rapidity of its action. The following standard solution is recommended:

STANDARD SOLUTION No. 1.

Dissolve Chloride of Lime of the best quality in soft water, in the proportion of four ounces to the gallon.

Use one pint of this solution for the disinfection of each discharge in cholera, typhoid fever, etc. Mix well and leave in vessel for at least ten minutes before throwing into privy-vault or water-closet. The same directions apply for the disinfection of vomited matters. Infected sputum should be discharged directly into a cup half full of the solution.

STANDARD SOLUTION No. 2.

Dissolve Corrosive Sublimate and Permanganate of Potash in soft water, in the proportion of two drachms of each salt to the gallon.

This is to be used for the same purposes and in the same way as *Standard Solution No.* 1. It is equally effective, but it is necessary to leave it for a longer time in contact with the material to be disinfected—at least an hour.

The only advantage which this solution has over the chloride of lime solution consists in the fact that it is odorless, while the odor of chlorine in the sick room is considered by some persons objectionable. The cost is about the same.* It must be remembered that this solution is highly poisonous. It is proper, also, to call attention to the fact that *it will injure lead pipes if passed through them in considerable quantities.*

STANDARD SOLUTION. NO. 3

To one part of Labarraque's Solution, (liquor sodæ chlorinatæ.) add five parts of soft water.

This solution is more expensive† than the solution of chloride of lime, and has no special advantages for the purposes mentioned. It may, however, be used in the same manner as recommended for *Standard Solution No.* 1.

The following powder is also recommended for the disinfection of excreta in the sick room and of privy-vaults, etc.:

DISINFECTING AND ANTISEPTIC POWDER.

One pound of chloride of lime; one ounce of corrosive sublimate; nine pounds of plaster of Paris. Pulverise the corrosive sublimate and mix thoroughly with the plaster of Paris. Then add the chloride of lime and mix well. Pack in paste-board boxes or in wooden casks. Keep dry.

As an antiseptic and deodoriser this powder is to be sprinkled upon the surface of excreta, etc.

To disinfect excreta in the sick room, cover the entire surface with a thin layer of the powder—one-fourth inch in thickness—and if the material is not liquid pour on sufficient water to cover it.

Disinfection of the Person.—The surface of the body of a sick person, or of his attendants, when soiled with infectious discharges, should be at once cleansed with a suitable disinfecting agent. For this purpose *Standard*

Solution No. 3. may be used.

In diseases like small-pox and scarlet fever, in which the infectious agent is given off from the entire surface of the body, occasional ablutions with Labarraque's Solution diluted with twenty parts of water, will be more suitable than the stronger solution above recommended.

In all infectious diseases the surface of the body of the dead should be thoroughly washed with one of the standard solutions above recommended, and then enveloped in a sheet saturated with the same.

Disinfection of Clothing.—Boiling for half an hour will destroy the vitality of all known disease germs, and there is no better way of disinfecting clothing or bedding which can be washed than to put it through the ordinary operations of the laundry. No delay should occur, however, between the time of removing soiled clothing from the person or bed of the sick and its immersion in boiling water, or in one of the following solutions; and no article should be permitted to leave the infected room until so treated.

STANDARD SOLUTION NO. 4.

Dissolve corrosive sublimate in water in the proportion of four ounces to the gallon, and add one drachm of permanganate of potash to each gallon to give color to the solution.

One fluid ounce of this standard solution to the gallon of water will make a suitable solution for the disinfection of clothing. The articles to be disinfected must be thoroughly soaked with the disinfecting solution and left in it for at least two hours, after which they may be wrung out and sent to the wash.

N. B. *Solutions of corrosive sublimate should not be placed in metal receptacles*, for the salt is decomposed and the mercury precipitated by contact with copper, lead or tin. A wooden tub or earthen crock is a suitable receptacle for such solutions.

Clothing may also be disinfected by immersion for two hours in a solution made by diluting *Standard Solution No.* 1 with nine parts of water—one gallon in ten. This solution is preferable for general use, especially during the prevalence of epidemics, on account of the possibility of accidents from the poisonous nature of *Standard Solution No.* 4. When diluted as directed this solution may, however, be used without danger from poisoning through the medium of clothing immersed in it, or by absorption through the hands in washing. A poisonous dose could scarcely be swallowed by mistake, owing to the metallic taste of the solution, and the considerable quantity which would be required to produce a fatal effect—at least half a pint.

Clothing and bedding which cannot be washed may be disinfected by exposure to dry heat in a properly constructed disinfecting chamber for three or four hours. A temperature of 230° Fah. should be maintained during this time, and the clothing must be freely exposed—*i. e.*, not folded or arranged in piles or bundles, for the penetrating power of dry heat is very slight.

The limitations with reference to the use of dry heat as a disinfectant are stated in a "Preliminary Report of the Committee on Disinfectants," published in *The Medical News*, Philadelphia, March 14, 1885.

The temperature above mentioned will not destroy the *spores* of bacilli—e. g. of the anthrax bacillus, but is effective for the destruction of all disease germs which do not form spores; and there is good reason to believe that this list includes small-pox, cholera, yellow fever, diphtheria, erysipelas, puerperal fever, and scarlet fever(?) Moist heat is far more effective, and it is demonstrated that ten minutes exposure to steam, at a temperature of 230° Fah., will destroy all known disease germs including the most refractory spores.

In the absence of a suitable disinfecting chamber, it will be necessary to burn infected clothing and bedding, the value of which would be destroyed by immersion in boiling water, or in one of the disinfecting solutions recommended.

Disinfection of the sick room.—In the sick room no disinfectant can take the place of free ventilation and cleanliness. It is an axiom in sanitary science that *it is impracticable to disinfect an occupied apartment*; for the reason that disease germs are not destroyed by the presence in the atmosphere of any known disinfectant in respirable quantity. Bad odors may be neutralised, but this does not constitute disinfection in the sense in which the term is here used. These bad odors are, for the most part, an indication of want of cleanliness, or of proper ventilation; and it is better to turn contaminated air out of the window, or up the chimney, than to attempt to purify it by the use of volatile chemical agents, such as carbolic acid, chlorine, etc., which are all more or less offensive to the sick, and are useless so far as disinfection—properly so-called—is concerned.

When an apartment which has been occupied by a person sick with an infectious disease is vacated, it should be disinfected. But it is hardly worth while to attempt to disinfect the atmosphere of such an apartment, for this will escape through an open window and be replaced by fresh air from without, while preparations are being made to disinfect it. Moreover, experience shows that the infecting power of such an atmosphere is quickly lost by dilution, or by the destruction of floating disease germs through contact with oxygen, and that even small-pox and scarlet fever are not transmitted to any great distanee through the atmosphere; while cholera, typhoid fever, and yellow fever, are rarely, if ever, contracted by contact with the sick, or by respiring the atmosphere of the apartments occupied by them.

The object of disinfection in the sick room is, mainly, the destruction of infectious material attached to surfaces, or deposited as dust upon window-ledges, in crevices, etc. If the room has been properly cleansed and ventilated while still occupied by the sick person, and especially if it was stripped of carpets and unnecessary furniture at the outset of his attack, the difficulties of disinfection will be greatly reduced.

All surfaces should be thoroughly washed with a solution of corrosive sublimate of the strength of one part in 1000 parts of water, which may be conveniently made by adding four ounces of *Standard Solution No.* 4 to the gallon, or one pint to four gallons of water. The walls and ceiling, if plastered, should be brushed over with this solution, after which they may be whitewashed with a lime wash. Especial care must be taken to wash away all dust from window-ledges and other places where it may have settled, and to thoroughly cleanse crevices and out-of-the-way places. After this application of the disinfecting solution, and an interval of twenty-four hours or longer for free ventilation, the floors and wood-work should be well scrubbed with soap and hot water, and this should be followed by a second more prolonged exposure to fresh air, admitted through open doors and windows.

Many sanitary authorities consider it necessary to insist upon fumigation with sulphurous acid gas-produced by combustion of sulphur—for the disinfection of the sick room. As an additional precaution this is to be recommended, especially for rooms which have been occupied by patients with small-pox, scarlet fever, diphtheria, typhus fever and yellow fever. It should precede the washing of surfaces and free ventilation above recommended. But fumigation with sulphurous acid gas alone, as commonly practiced, cannot be relied upon for the disinfection of the sick room and its contents, including bedding, furniture, infected clothing, etc., as is popularly believed. And a misplaced confidence in this mode of disinfection is likely to lead to a neglect of the more important measures which have been recommended. In the absence of moisture the disinfecting power of sulphurous acid gas is very limited, and under no circumstances can it be relied upon for the destruction of spores But exposure to this agent in sufficient quanity, and for a considerable time, especially in the presence of moisture, is destructive of disease germs, in the absence of spores. It is essential, however, that the germs to be destroyed shall be very freely exposed to the disinfecting agent, which has but slight, penetrating power.

To secure any results of value it will be necessary to close the apartment to be disinfected as completely as possible by stopping all apertures through which the gas might escape, and to burn not less than three pounds of sulphur for each thousand cubic feet of air-space in the room. To secure complete combustion of the sulphur it should be placed, in powder or in small fragments, in a shallow iron pan, which should be set upon a couple of bricks in a tub partly filled with water, to guard against fire. The sulphur should be thoroughly moistened with alcohol before igniting it.

Disinfection of privy-vaults, cess-pools, etc. When the excreta—not previously disinfected—of patients with cholera or typhoid fever, have been thrown into a privy-vault this is infected, and disinfection should be resorted to as soon as the fact is discovered, or whenever there is reasonable suspicion that such is the case. It will be advisable to take the same precautions with reference to privy-vaults into which the excreta of yellow fever patients have been thrown, although we do not definitely know that this is infectious material. Disinfection may be accomplished either with corrosive sublimate or with chloride of lime. The amount used must be proportioned to the amount of material to be disinfected.

Use one pound of corrosive sublimate for every five hundred pounds—estimated—*of fecal matter contained in the vault, or one pound of chloride of lime to every thirty pounds.*

Standard Solution No. 4, diluted with three parts of water may be used. It should be applied—the diluted solution—in the proportion of one gallon to every four gallons—estimated—of the contents of the vault.

If chloride of lime is to be used, one gallon of *Standard Solution No.* 1 will be required for every gallon—estimated

—of the material to be disinfected.

All exposed portions of the vault, and the wood-work above it, should be thoroughly washed down with the disinfecting solution.

To keep a privy-vault disinfected during the progress of an epidemic, sprinkle chloride of lime freely over the surface of its contents daily. Or, if the odor of chlorine is objectionable, apply daily four or five gallons of *Standard Solution No.* 2, which should be made up by the barrel, and kept in a convenient location, for this purpose.

Disinfection of ingesta.—It is well established that cholera and typhoid fever, are very frequently, and perhaps usually, transmitted through the medium of infected water or articles of food, and especially milk. Fortunately we have a simple means at hand for disinfecting such infected fluids. This consists in the application of heat. *The boiling temperature maintained for half an hour kills all known disease germs.* So far as the germs of cholera, yellow fever, and diphtheria are concerned, there is good reason to believe that a temperature considerably below the boiling point of water will destroy them. But in order to keep on the safe side it is best not to trust anything short of the boiling point (212° F.) when the object in view is to disinfect food or drink which is open to the suspicion of containing the germs of any infectious disease.

During the prevalence of an epidemic of cholera it is well to boil all water for drinking purposes. After boiling, the water may be filtered, if necessary to remove sediment, and then cooled with *pure* ice if desired.

A sheet of filtering paper, such as druggists use, and a glass or tin funnel, furnishes the best means for filtering water on a small scale for drinking purposes. A fresh sheet of paper is to be used each day.

The above "Preliminary Report" has been prepared at the request of the *Sanitary Council of the Mississippi Valley* as expressed in the following resolution adopted at its recent meeting in the city of New Orleans (March 10-11, 1885).

"Resolved. That the Secretary request from the Chairman of the Committee on Disinfectants, appointed at the last meeting of the American Public Health Association, a plain, practical paper on Disinfection and Disinfectants, for popular use and distribution, to be furnished to the Chairman of the special committee of this Council on General Sanitation."

GEORGE M. STERNBERG, Major and Surgeon U. S. A.
Chairman Committee on Disinfectants.

ARTICLE II.

SYMPTOMATIC PATHOLOGY OF THE MOUTH.

BY ELTON R. SMILIE, M. D., SAN FRANCISCO, CAL.

(Continued from last Number.)

After four hours had past in almost total abstraction, from thoughtful self-control or mindful of being led like a child in leading strings, she rose to depart without the slightest allusion to the nature or seat of her disease, and proffered me an unheard of fee, even as a recompense for successful capital operations in surgery which jeopardized life. With the rapidity of startled thought I scanned in review our conversation to see if any portion of it could be constructed into any of the legendary traits of Finnish and Yankee expressions of selfish longing, and although I failed to detect either in feeling or language the motive that has earned for them the stigma of petti-fogging tricks for gain, I could not restrain my tears, impressed with the thought that I had in some way given occassion for her to entertain so poor an opinion of me as to suppose I would take a feé for receiving rather than conferring a service.

Her well-trained perception quickly appreciated the nature of my reflections, and to soothe the wound and make me understand the distinction upon which her apparently prodigal estimation of service rendered had been based, she explained that if the aid had depended solely upon mechanical talent of filling teeth united with the *noli me tangere* delicacy of touch required in dealing with the nerves to insure a comparatively painless operation, she would have been satisfied with paying me the accustomed equivalent for occupying my time in preparatory consultation. But her requirements were of a higher order than the mere mechanical dentist could fulfill, "of this," she said, "I consider myself competent to judge; for in premonition of the necessity from physicial warnings brought on by the irregularities of my habits, I passed two courses, disguised as a student, in the University of Paris; my studies confirmed me in the belief that I had incurred certain predispositions even after I had relieved my mind from the imaginary fears that leads almost every student to adopt the different maladies described in lectures and books. Acting upon the impulse of impressions I consulted in freedom from disguise all the different professors, and each examined me with all the appliances of his specialty, but no two agreed in stating the nature, or location of the disease, or treatment of my system for the amelioration or cure of the diseased tendency, and were only infallible in the exorbitant fees charged as an evidence of their ability. So you see, child, that without flattery, I have placed a just estimate upon the service you have already rendered me, as the demonstrator of certain symtomatic effects upon parts of the mouth as an evidence of diseased translation from remote organs, —which I have drawn from you unconsciously,—is a true interpretation of my own feelings, and has realized my premonitions, and to-morrow I will give you the opportunity for directly verifying your relative diagnosis. You will perceive from this statement in train for other confirmations, without computing in payment of indebtedness the enlistment of gratitude for corrective reproof of my conscious delinquencies, that I have not been over-generous in money compensation. You have probably heard much that is true of me by common report, and greatly to my disadvantage, but as it is but reasonable to suppose that persons have a better knowledge of their own acts and the motives that prompted them, to-morrow I will make known to you everything that can possibly have a bearing upon my disease and complications, necessary for your aid in forming a correct diagnosis. But it will be with shame and regretful grief; for you will then realize that even with your manifest inclination, we cannot enjoy the privileges of open friendship, as the reputation of being more sinful than the actual passages of my life, would blast the integrity of yours, allowing that your pitying disposition could overcome its natural abhorrence of instincts which prompted my transgressions, and holding it reasonable that my sufferings from physical retribution would prove a sufficient punishment without the addition of your scorn. You will perceive by these hints that the opinion of the public, usually ungenerous, has done me no great wrong in pronouncing judgment upon the course of my past life. Still you will urge in my defence, that there was a leading period in my life which was blameless of the intention to do wrong, and that example was the incentive that gave me the bias to adopt evil temptations before my perceptions were sufficiently matured to forsee the inevitable results. In this respect your palliative reflection would be just, and my regrets for the influence, and indignation against the personal example of the school teachers who led me astray, are constant, and I have ever retained an emulous admiration for a woman who has preserved her purity unimpeached and conformed to the inborn promptings which her modest nature should recognize as legitimate with the instincts of our sex. These innate impressions confirm me in the belief, that if they had not been misdirected, my natural inclinations were good, and with aid, cultivation would have afforded me in development as true a sorce of happiness as the opposite course has obtained for me an unenviable notoriety. Receive the fee, child, as an evidence of my confidence in your ability to render me both physical and moral benefits that will exceed the power of money to purchase, and if you can overcome your repugnance to the sacrifices of womanly modesty I have made to vanity for the gratification it would afford to hold intellectual supremacy, you will enable me to counteract in a measure the evil influence that I have hitherto exercised in giving freedom to unchaste thoughts in a class of society, that from position controls and shapes the fashion of speech, clothes, and style of movement to all the lower grades of humanity."

As she was persistently earnest in her intention to endow me before trial, she accepted my proposal that it should be recorded in her note book as a proffered recompense that I would accept if my treatment proved beneficial. In parting for the night she made a quick motion, as if to receive and return my proffered kiss, then withdrew her head with salutation, and with a sad expression of face shook my hands and departed.

A sleeples night was passed in reviewing our conversation, and although I could not fail to understand the motive of the evening visit, it had been so skillfully disguised with the interest enlisted and delicate tact, that she accomplished her purpose with a success in developing my latent thoughts that in review greatly surprised me, as unaided by suggestion they would have remained in embroy. But instead of feeling mortified that I had been made a passive instrument of demonstration, I was gratified that I had acquitted myself so well as to gain the confidence of one so gifted in all the arts that contribute to gain the possessor a well-founded reputation for the variations of wisdom and wit, which unfortunately with our sex is usually combined with characteristic traits of folly engendered by attrition in acquisition. In vain I tried to conjecture the nature of her disease, and although she had at times hesitated and placed a check upon her tongue when a certain class of diseases were discussed, I was loath to even think it possible that a person of her refined cultivation could by any vagary of instinctive passion, knowingly expose herself to the chance of contagion from so vile a pollution, and censured myself with injustice for thoughtful preparation in view of the method of treatment should it prove to be a metastatic translation of the kind, and earnestly hoped that my admiring reverence would not be so easily humiliated.

Fortunately the day following was exceedingly cold, so that I felt sure that I should be obliged to accept the proviso of a Russian winter engagement, "I will surely come if it is not *very* cold," for those in the ordinary routine of mechanical operations. As I anticipated, hers was the only engagement kept, and with a sympathetic consideration for the comfort of her servants for which I was prepared to give her credit, she dismissed them with an appointment, and in reciprocal bearing on their part they showed a differential attachment quite opposite in expression to the indifference manifested by my patrons of the higher nobility for the welfare of their servants.

Upon receiving and helping her to disrobe I could not fail to discover from her care-worn face that she had passed not only a sleepless but an anxious night, and when seated in my operating chair her eyelids quivered and it was only with a manifest effort of will that she regained sufficient composure to enable her to give me a relation of the symptomatic cause of her apprehensions. As she proceeded my fears and sympathies were strongly excited, and when it came to an examination of her mouth I found to my dismay its condition the exact counterpart of Mrs. P's, whom you attended during the closing year of my novitiate. The left inferior maxillary wisdom tooth had in it a large gold filling condensed to a perfect weld, that had in the main received an unscratched finish, but a notch here and there of the holding rim showed that with all his care, the dentist had not directed the point of his instrument securely upon the border line of gold necessary for forming a compact junction with the bevel angle wall beneath the rim. Upon inquiry, my patient said the filling of the tooth had caused her intense pain although the pulp was not exposed, but the jar of the instrument upon the dentine seemed to compress it and send a pang with each stroke to the eye and ear, and from the irritation a chronic sensitiveness succeeded, and continued until six months after the operation she took a cold that resolved it into an active state of ulceration that required a month's active counter-irritation to subdue. The second molar had a small filling inserted at the fissure junction in the crown's central depression. With the exception of these, the balance of her thirty-two teeth were in excellent condition, and of that peculiar structure that gives sure indication that in hereditary transmissions the constituents of her bony system had remained free from the taint of degeneration through a long reach of progenitors. This, with the history she gave me of her ancestors' habits, afforded me the hopeful feeling of certainty that I had not the septic infliction of predisposition to contend with. But it was enough for direct diagnosis, that I discovered the liver-colored and shaped fungus starting in growth from the neck attachment of the gum of the diseased wisdom tooth, and extending backward toward the fauces. Fully impressed with the danger I should have to contend with, after the extraction of the tooth from the rapid growth of the fungus, if as with Mrs. P's the seat and cause of translation was uterine irritation during the process of gestation, with a feeling of blushing hesitation I questioned her, as from public report and her personal relation I had received no hint of her being a married woman. With more marked confusion than she had yet shown, after many stammering attempts to speak, she faltered, "Yes, child, it is as you judge, but hoping there would be no necessity, I could not reveal to you so great a cause for shame; but now I might as well make a clean conscience of it, for one's sins are sure to find them out." She then related that she had been five times in the process of motherhood, three of which matured with the birth of two boys separately, and two girls, twins, all free—up to the present time—from developed hereditary disease of any kind; and to secure them from the temptations which had led her astray, and unacknowledged birth paternity, had placed them as the children of a widowed mother, of rank, in the charge of English Episcopal clergymen to receive their education. "Thus you will see, child, mis-steps of the kind lead to a chain of errors which in turn fetter you to a life of falsehood, from which there is no honorable way of escape, except by death, which if slow brings the tormenting fears of reflection that your children may suffer shame on your account." In answer to my inquiry, with regard to the condition of her appetite during the period of gestation, and whether she suffered pathognomonic symptoms, out of the healthy course. She stated that with her first two children she had a normal appetite that ranged within the usual bounds of nutrition, with only an increase adapted to the duplicate process for sustenance; but when enciente the fourth time she took abortives to relieve herself from the incumbrance, and then for the first time experienced the pains of toothache and the vagaries of a morbid appetite. Apparently observing the shock of disappointment that flushed my face from a confession so repulsive to the innate modesty and humane tenderness excited in anticipation of approaching motherhood, she answered to the expression, "Yes, child; *the one* fatal mis-step once taken in girlhood, disrobes the unguarded victim of every charm that should raise her above, and protect her from the brutish instincts of our body's animal propensities; and the more elevated our capacity to realize all that is beautiful in the present life from the cultivation of the ideal, which becomes to the pure woman the echo of immortality, the greater the power she possesses for evil and self-debasement, and alas, that I feel constrained to acknowledge it, to you, I have often exulted in my ability to lead the aping, common herd to their own destruction. But relentless remorse ever haunts me to raise hopes of redemption only to crush them with the extraction of some new form of impetuous passion that leaves me to sink deeper in admiration, but by full confession must startle into self-defence the womanly pride of your innocence; still I am grateful to your emulous mercy that is fully interested for the cure of my self-inflicted physical ills.

Try and bear with me, without feeling yourself humilitated in sex alliance with one who has committed so many gross errors, and now feels acutely that the mental and physical punishment is justly merited, and may be the means through your instrumentality—if my life is spared —of restoring me to a career of usefulness that for a short period of repentance I once enjoyed; and instead of accounting me a murderess, think in extenuation, if you can, of the misery, worse than death, that would have been entailed upon them if born to a sullied and illegitimate heritage."

Despite your cynical sneer at her abortive repentance, and pleading skill to enlist all my mental energies in her behalf, I know, that secretly, you are as soft and sympathetic in your emotions as any woman can be, and would very much quicker have fallen upon her neck and greeted her pleading resolution with tears than I did—perhaps to its mutual undoing—for her power over men in mental accord must have been irresistible, notwithstanding your warning that the physician's mind should be kept free from all compassionate bias while balancing the symptoms with the personal experience of the patient, to obtain a correct diagnosis and indictations for treatment. But after our emotions had somewhat subsided, the necessity of following your advice became strongly impressed upon the patient as well as myself, for the sensational scene had demonstrated the almost insuperable difficulty that sensitively intelligent women will be obliged to overcome before they can command the disinterested control of their feelings in a sufficient degree for the unbiased exercise of perception required for tracing the tendency of disease in all of its variations from cause to effect, necessary for a correct diagnosis and successful treatment. Besides, with the doctress and patient who are affinitised in sentiment the conversation in examination will be too diffusive for speedy decision in complicated diseases, and those of an acute form requiring quick and determined action, of which, you will say, I am giving you ample illustration. Now, I will try and show you that I have taken a lesson from the womanly failings I have acknowledged as the besetting sins of our sex, by giving as concisely as possible the result of my treatment.

Although the disease, in its fungoid development around the wisdom tooth, had made its appearance but three days before, premonitory lancinating pains had been felt in the jaw for a month or more, reaching from the second molar backward to the angle of the jaw. These symptomatic precursors so well defined the location and limits of the inceptive stage of the disease, I was forwarned, and reminded of your experience of the necessity of prompt action, and made my preparations accordingly. But with all my anticipations and forebodings, was not prepared for the rapid development of its malignant character, which succeeded the extraction of the second molar and wisdom tooth; and now wonder that I preserved my self-reliance that enabled me to cope successfully with the aggravated irruption of this formidable disease, for in less than an hour its fungus filled and over-lapped the sockets margins notwithstanding the free use of the powerful caustic with which you supplied me; and but for the instrument you devised for its protection in application would have baffled all my efforts, as a perfect deluge of saliva poured forth from the glands that would have neutralized its effect. Again, fortunately the wash of the saliva prevented the swallowing and absorption of the dissolved poison of which the caustic is composed, for, although I applied it constantly for five hours there was no deleterious effect, other than slight nausea, and then I had the extreme relief of seeing the liver hue turn to white, showing that the mushroom growth of the fungus was stayed. Still, I did not trust to favorable appearances, but continued the application at intervals during twenty-four hours, when the reaction of sloughing commenced and afforded me the first view of the sockets bony margin, and enabled me to probe and penetrate the cellular tissue of the jaw without the root enclosure, which was broken down, and the matter of its decomposition imparted to the instrument the most unbearable odor that ever came within the scope of my nostrils, and produces a repetition of the sensation of disgust whenever I think of it. It surprised me that no blood flowed from the extraction of the teeth, as you had cautioned me to have all my appliances ready to stop it, as it would prove a hindrance to the effective use of caustic, from coagulation. That, there was no flow bood, I ascribed to the pressure of pent-up matter upon the venous vessels; and by allowing the caustic to act more readily, fortunately produced a quicker and more favorable result, that relieved my anixety from a tension almost insupportable.

As a caution against its eruption after the cavity was free from matter, I syringed it thoroughly with a solution of muriate of mercury, using a curved spoon excavator to remove the partially decomposed substance, and cotton fastened to the end of a copper wire sufficiently flexible to clean it more perfectly in every part that there might be no absorption for the secondary production of fragilitas cancrum. This treatment was alternated with the local application of antimonial potash, and administration of the hypophosphites of lime and soda, with variations suited to the symptomatic indications. In my investigation for pathognomonic cause and resulting variations, never was doctor or doctress more favored than I with the intelligent interpretation of symptoms afforded by my patient; but with a sympathetic confidence that encouraged in me self-reliance—the inspired source of ability—she never even suggested a remedial measure; but after convalescence, acknowledged that her curiosity was strongly excited, in every instance, to learn the method my judgment proposed to adopt to combat unfavorable tendencies, and when announced felt a calm assurance of its success. In questioning the source of this reliance, so contrary to your experience in San Francisco, I could but attribute it, in contra-distinction, to the superior intelligence of my patient; who reasoned correctly when she thought that remedial promptings from her would but serve to render uncertain the natural deductions of my own judgment, and am truly thankful that my first serious case afforded me the benefit of such efficient co-operation on the part of my patient, and am convinced that she possesses that power of self-control over her passions and appetites that will afford her the assurance of freedom from relapse. Although, to her leading natural intelligence, acquired ability, and worldly experience, I feel myself chiefly indebted for the successful result, and would consider myself amply repaid by the knowledge gained through her skilled development of my innate powers of thoughtful deduction, I find myself; *perforce*, the possessor, in fee simple, of an elegant establishment that of itself attracts the class of patients most desirable, and the princessly gift is still more enhanced to my grateful pride, with the knowledge that she openly ascribes her recovery, from the much dreaded disease, to my treatment. In advocating with grateful expressions of praise her sense of my ability, I feel that she exceeds by far my just merits; but when I expostulated and expressed the fear that it would make us both appear ridiculous as of the mutual admiration class, she replied, "dear child, as you grow older in experience and your powers of analytical observation expand, you will become less sensitive with regard to your speech in conversation with the ordinary style of people that rank as first-class in society association; for as a general practice they neither think, reflect, nor remember, and if they attempt to repeat what they hear, are certain to make a muss of it,—and to their blunders, as with the Finns and Irish, I owe many of the hits that gained for me a reputation of humor and wit. The exceptions to this average are few and far between, as is merit with the well-patronized in your profession; for pretension in it, from the beginning, has held ruling supermacy, and I would much more readily employ an obscure well-educated person to treat me medically, than the usually successful professional parrot who has talked him or herself into popular society patronage; so you need have no fear of reaction from my over-gulling the gullible vanity of those who live to forget the useful experience of the past for the winged sensations produced by herding attractions."

Of course, I fell that I shall have your warmest sympathy and congratulations, not only for the successful treatment of my first case of this formidable disease, but in extreme pleasurable exaltation that the greatness of my recompense was not derived from publicly over-rating or insinuating the possession of extraordinary ability, or any other pretext for extortionate rating of my payment expectations; and I am sure that you cannot depreciate or regret more sincerely than I do my unworthiness of the over-valuation placed upon the service rendered, when rated by the scale of worldly calculations, void of the consolatory expression of gratitude it tacitly expresses. * * * In the relation I have not specified the medicative means used in the different stages of the suppurative and healing process, as they were mainly of your suggestion and pre-paration, the variations were only those required to act in accordance with difference in constitutional and circumstantial impressions.

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NOTE.—In the case of Mrs. P., referred to in the relation, the translation of the irritating cause for the development of the cancerous disease of osteo-sarcoma to the predisposed carious teeth and jaw, was more apparent than the description of the Russian example demonstrated. Mrs. P. was a Russian Jewess, born in Moscow, of Germo-Polish parentage, and had lived a migratory life; the first knowledge obtained of her habits and predispositions was while she was a resident of Panama, N. G., then a miss of eighteen; fifteen years after as a married woman she verified the prognosis of a latent cancerous tendency.

In her reckoned third pregnancy, the left inferior maxillary wisdom tooth, and anterior molars, became over-lapped with a fungus liver-hued growth, which was attended by a deep-seated throbbing pain in the jaw, to which her sensations referred it in contra distinction to tooth-ache; this extended to her left eye with neuralgic twitches. An examination showed a slight protrusion of the eye with contraction of the pupil, which remained immobile to the effect of belladonna, while the other seemed unduly sensitive to its influence. As the disease progressed the cause of this immobility became apparent from the induration and consequent contraction of the schlerotic membrane in counter compression to the protrusion from evident enlargement or tumefaction of the branch connections of the optic nerve with the posterior portions of the eye-ball, showing an anastomotic communication of the maxillary nerves with those of the eye, or more probable direct symptomatic translation of diseased irritation from the gravid uterus, as in cases of temporary myopia and in permanent, caused by excessive vagno-uterine excitement from masturbation and undue venery. Yet, in affecting a cure of the jaw osteo-sarcoma, the sight of the eye was improved and the induration and convexity abated, showing plainly that uncontrolled the disease would have extended to the eye.

In her case the disease was greatly aggravated by the continued use of the most indigestible substances, many of which could only be supposed to yield nutriment by a stretch of imagination; and it required the positive assurance of being left to her fate before she would submit to the alternative of a regulated diet. When the four teeth were extracted there was a copious flow of blood and fetid matter, which from coagulation rendered the application of caustic comparatively ineffective, and it was not until after the eleventh day that the suppurative process set in.

During the interval, from the extraction of the teeth to suppuration, the fungus growths were thrown out so rapidly that they over-reached the tongue and impeded breathing and threatened suffocation, so that portions had to be cut away, but with the advantage of allowing the caustic cup to compress and check the flow of blood, and by this course, reaction was established. At intervals, during the twelve months that it required to restore healthy action to the bones and membrane investments of the diseased parts, treatment was suspended to test the recuperative powers; but up to the time of her delivery of a still-born child, at full term, some act of imprudence would bring back all the local symptoms of her disease, that required renewed active treatment. The child, although well developed in the personals of Jewish idiosyncrasy, bore plainly the impress of its mother's disease. At the expiration of the twelfth month, from date of treatment, the patient was dismissed, with the warning that if she became pregnant again it would be almost certain to reproduce the cancerous predisposition, which would cause a consumption of the earthly constituents of the bones, and a lingering death, For five years she remained in comparatively good health. considering her habits, and then became pregnant again, but found a physician who aided her in procuring an abortion; after its accomplishment muscular power in locomotion gradually diminished, until it was with the greatest effort that she could succeed in crossing the room. In watching her movements, when attempting to walk, the want of stability in the long bones of her legs was very evident, and the wavering unsteadiness of her motions and lack of confidence in her voluntary powers, could be easily traced to the yielding bones from muscular contraction, they lacking necessary fi[illegible] in process of eruption, right and left central well developed, right lateral rudimentary in form, no evidence of pre-canine on left side.

Model 18. Case 6.—Adult dentition, two bicuspids and canine on left side normal in form and position, well marked pre-canine on left side. The dentition on the right side apparently irregular in character.

Model 26. Case 7.—Adult normal dentition, well marked pre-canine on left side.

Model 19. Case 8.—Adult normal dentition, crown of pre-canine on left side apparently excised.

Model 13. Case 9.—Adult dentition, no pre-canine on left side, and no left central incisor.

Model 23. Case 10.—Adult dentition, no pre-canine on left side and no left central incisor.

Model 17. Case 11.—Adult dentition, no canine or pre-canine on left side, and no left central incisor.

Model 14. Case 12.—Immature dentition, no right canine, indications of left canine and pre-canine, in process of eruption.

Model 28. Case 13—Adult dentition, no pre-canine on left side, and no left central incisor.

Model 29. Case 14.—Adult dentition, imperfectly formed teeth, no pre-canine on left side, and no left central incisor.

Model 15. Case 15.—Immature dentition, no pre-canine, permanent canine apparently in process of eruption.

Model 24. Case 16.—Adult dentition, indications of two teeth on the left side in the canine region.

Model 20. Case 17.—Adult dentition, canine on left side, no indication of pre-canine.

SECOND SERIES—RIGHT-SIDED FISSURED ALVEOLI.

Model 1. Case 18.—Adult dentition, canine on right side, pre-canine erupted in the palate, but at the margin of the cleft no right central incisor, and one bicuspid missing on each side.

Model 8. Case 19.—Adult dentition, canine on right side, pre-canine erupted in the palate, but at the margin of the cleft, right central incisor in normal position.

Model 9. Case 20.—Adult dentition, canine on right side, pre-canine erupted in the palate at the margin of the cleft, right central present but semi-rotated.

Model 6. Case 21.—Adult dentition, canine on right side, no pre-canine, no right central incisor, left central incisor rudimentary in character.

Model 10. Case 22.—Adult dentition, canine on right side, pre-canine uncertain, right central present.

Model 2. Case 23.—Adult dentition, canine on right side, no pre-canine, no right central.

Model 3. Case 24.—Adult dentition, canine on right side, pre-canine excised, erupted in the palate at the margin of the cleft, no right central incisor, two bicuspids missing.

Model 7. Case 25.—Adult dentition, canine on right side, pre-canine possibly in the gum, right central incisor present.

Model 4. Case 26.—Adult dentition, neither canine nor pre-canine erupted, no right central, left central excised.

Model 5. Case 27.—Adult dentition, canine on right side, no pre-canine, no right central, left lateral apparently extracted from outside of dental arch.

THIRD SERIES.—DOUBLE ALVEOLAR FISSURE.

Model 30. Case 28.—Adult dentition, canine on each side in normal position, pre-canine on right side normally placed in dental arch, pre-canine on left side erupting outside of dental arch.

Model 23. Case 29.—Adult dentition, canine on each side, pre-canine on left side in dental arch but not fully erupted, pre canine on right side imperfectly erupted outside dental arch.

Model 32. Case 30.—Adult dentition, canine on each side, pre-canine on left side fully erupted in dental arch, condition of right side uncertain.

Model 31. Case 31.—Adult dentition, canine on each side, no pre-canine.

OBSERVATIONS.

1. It will be observed that there is not a single instance of fissure of the alveoli occuring between a true lateral incisor and canine on either side of the mouth.

2. That in five out of ten cases of right-sided fissure the right central incisor is missing.

3. That in eight out of seventeen cases of left-sided fissure the left central incisor is missing.

4. That in five out of seventeen cases of left-sided fissure a pre-canine tooth is clearly present.

5. That in four out of ten cases of right-sided fissure the pre-canine is clearly present.

6. That in two out of four cases of double alveolar fissure a pre-canine is present on each side, and in a third case, on the left side.

7. That there is not any sufficient evidence in any case of increase in the number of teeth in the pre-canine region, whilst there is distinct evidence in some cases of the reverse condition, and also of imperfect development.

8. The evidence at present before us is quite insufficient for the purpose of arriving at any conclusion, whilst the seven models without any numbers attached will indicate the singular liabillity of the pre-canine region of the upper jaw to irregularity, of a purely dental origin.

9. The chief aims of observers for some time to come must be the examination of fissured alveoli very early in life, the careful dissection of the premaxillary bone in cases where it has been excised for the better treatment of hare-lip during infancy and the collection of very accurate and carefully preserved models for the purpose of recording the exact condition of the teeth at various ages.—*London Dental Record.*

ARTICLE IV.

CLIMATE, FOOD, AND ASSOCIATIONS IN FORMING RACES.

BY JAMES TRUMAN, D. D. S., PHILADELPHIA, PA.

The prevalent idea that teeth vary according to climate, food, etc., is probably true, and needs no argument to refute it; but to what extent this variation takes place in teeth, more than in other tissues, is not clearly indicated. In fact, it is a subject encompassed with difficulties. Dentistry is too young, and the trained workers too few, and the statistics, collected from professional sources, too meager to arrive at any definite conclusions. It is, therefore, only, possible to skim over the surface, and, perhaps, glean a few facts, leaving the result to the future for that correction which must necessarily come from more positive observation. That climatic influences have largely to do with the formation of tissue is axiomatic, and would seem to need no words to make it self-evident, but the processes through which this is effected are by no means clear. They enter into the realms of mysterious influences that operate to evolve life from the minutest atom to the fully-developed animal; from the unorganized protoplasm to the almost God-like mentality of man. Till we can define what the correlation of forces really means, till we can fathom the mysterious border-land, which no microscope has ever penetrated, we must grope in profound darkness. Here observation ends and theory begins, and yet, behind this theory, in the illimitable void, lies the true home of the forces, which aggregated, create life and life-forms where-ever we find them. The most powerful forces are the intangible. We call the fall of bodies to the earth the force of gravitation. We recognize the fact that the universe is held in position by a power invisible and incomprehensible to the human intellect. The world of causation lies beyond our present reasoning powers or our most powerful objectives. We recognize certain effects, but the causes are shadowed in the realms of mysterious life.

Whether we view life in the concrete or examine it in its simplest forms, we are impressed with the fact that the laws of formation are everywhere imperiously present, and that atoms, organized or unorganized, are but the creatures of influences which through all apparent aberrations, are resolved finally into harmonious relations. While we may formulate the law into words and say, evolution is progressive development, we are met at the begining of our inquiry by apparent contradictions—contradictions which the few thousand years accorded us for observation have failed to clear up. The apparently unchanging color of the different races of men, and their typical forms, continuing through successive ages, have never been satisfactorily traced to climatic influences or differences in food and surroundings. The world has rested content with the explanation that the color of the negro was the result of tropical heat through countless generations, but it is somewhat difficult to reconcile this statement with the facts of history and observation. The effect of color was supposed to be largely dependent on the degree of distance from equatorial regions. This theory is met by the equally difficult fact of the existence of light-shaded men in the interior of Africa, and from that other long and well known fact that the coppery tinge is common to races in temperate zones. The negro appears to be a distinct type and cannot be confounded with any of the other tropical races. It may be argued, with some degree of plausibility, that if he is the result of climatic influences, then, by the same influences, other races, similarly circumstanced in regard to heat, should have been similarly formed; but they are wanting in many of the attributes of color, form, etc. The North American Indian indicates by his color his probable Asiatic origin, for there is nothing in climate to cause the tinge, else would two hundred and more years have given some evidence of change in our own race. But if change exist at all, it has been on the side of improvement, and the American of to-day—in the North, has less color than the races from which he sprang. Yet, the negro of the present is the negro of all history. When Assyria was in its glory he was a factor in its civilization, and lives to-day in its ruined temples. When Egypt was young, Africa was evidently old, and the Nubian of the nineteenth century is the Nubian of a period of which only the records in stone are left. We can recognize this coloring of races from the negro to the pure Caucasian, but we are left stranded on the shoals of inconclusive data, in bays to which no rivers lead, in results which, however closely followed, are traceable to no absolute cause. If climate produced in uncounted ages a negro, it should in similiar periods undo its work under more favorable circumstances. The records of observation are too limited to solve this problem. So difficult is it to reconcile facts with the theory of evolution, that men like Agassiz have not been able to accept it, but have clung—perhaps unreasonably—to the old and equally difficult theory of distinct creations. While admitting the force of the argument that no perceptible change has occurred in history, written or unwritten, in the color of man as regard races, we do know that the color deepens by exposure to the tropical suns; and this, through successive action of generations, ought to produce a result as intense as that of the negro. There should be some evidence of value in its respect found in the Spanish races that have peopled the tropical regions of this continent, but, unfortunately, they are of too mixed a character to be worth anything as a basis for inductive reasoning.

Without entering into this line of argument further, it is very clear that the surroundings to which animals and men have been subjected have had much, if not all, to do with the various productions that we witness. Probably no instance on as large a class in modern times has occurred as the changes that have taken place in our own country. The time is short—barely more than two centuries—and yet the American type is as fixed and as marked as any of the older races of the world. It is said, and with truth, that we are a mixed race; but making due allowance for this, there is a certain undefined and undefinable appearance that marks our race, as it marks all races. The American form is as distinct from the German stock, from which it in the main sprung, as it is possible to imagine. Who can fail to observe the square shoulders and broad hips of the Teuton and not draw comparisons favorable to the sloping shoulders and graceful lines of the form of the American-born? These are marked distinctions and strike the eye at once. They demonstrate what I regard as a fact, that slowly, but surely, we are growing a type of men and women that in time will be a distinct race, grafted on old stocks, but molded by climate, food, natural associations and the law of harmonious development into a class—whether superior or inferior, at least widely different from all others.—[Trans. Odontological Society.] *Items of Interest.*

ARTICLE V.

TEMPORARY TEETH.

E. J. LILLY, M. D., D. D. S.

Several days ago a father brought to our office his seven-year-old son, suffering from a badly diseased temporary tooth. The father was one of those fussy, fidgety men, always making some remark, but never saying the right thing at the right time. The child was almost scared to death, and when he discovered he was at "the dentist's," seemed to about to collapse. He had been systematically deceived in regard to the cruelty and "horridness" of a dental operation, and was consequently wrought up to a pitch of fear and dread, that ought to have put the father to shame. We tolerated the man's talk for a few minutes, then told him very pleasantly, but firmly, that we would take the boy into another room, and ascertain what could be done for him. After securing his confidence by asking a few questions, and telling him a short story, we examined his tooth and told him what was necessary to be done in order to relieve him. He was then ready to have his tooth treated. This was accomplished without any more ado, much to the surprise and gratification of the father. We then explained, as well as our limited time allowed, the benefits of early consulting a dentist, and he promised not to be so negligent in the future.

In dealing with children, the dentist must be kind and considerate, but firm, and have a strict regard for the truth. We must remember they will be our future patients. Untruthful statements, rough manipulation, and a severe demeanor, leave the impression on the mind that the "horrid dentist" is a person to be avoided. If we do not make it as pleasant as possible for them when young, in after life they will apply to us only as the last resort.

We presume most dentists have found that operating for children is difficult and tedious, and often requires great patience and self-sacrifice. But after gaining their confidence, and by gentle manipulation, the operation can be successfully performed. But it must be remembered in operating that the pulps of these teeth are relatively large, and come near the surface. The work, nevertheless, should be thorough, as their texture renders inperfect fillings almost valueless. * * * * * *

In general, the deciduous teeth have received attention only when the sufferings of the child have rendered palliative treatment necessary, preventive treatment being comparatively a rare procedure. Cleanliness is as essential here as with the second set. The first step should be to teach the use of the brush, and, when necessary, the removal of the stain or deposit which often adheres with tenacity to the enamel. The use of the brush should be taught as soon as the child has sufficient intelligence to learn it; and previous to that time, this duty should be done for him. They should be brushed three times a day with a soft brush, on which has been placed a little soap and powder, brushing up, down and across.

These small teeth accomplish admirably the purpose for which they were designed, and it is our duty when called on for advice to expend the energy, exercise the patience and tolerate the annoyances necessary to keep them in good condition till they give place to the more permanent denture. There is a common belief among parents that the "first teeth" are unworthy of any attention except that given by the forceps. But they have a useful purpose to subserve, and are really indispensible to the health of the child. Besides they bear such intimate relations to the permanent teeth as to render their preservation of vital importance.

The temporary differ from adult teeth in size, form and dentisty, and require to be carefully dealt with till the child is old enough to do without them. Between the fourth and ninth year is the period demanding the most attention, the child at this time being sufficiently manageable A pleasing story, or a talk about their plays or pastimes will most always gain their good-will, and this is half the battle. Parents must be advised to have their children's teeth examined at intervals, and the importance of this should be impressed on their minds. It is not enough to urge and persuade them to do this; we must, rather, make clear to their understandings the reason why one thing is right and another wrong. Mothers, specially, have a great tenderness for their offspring; for this reason it is easy to find an excuse for neglect. That they should be anxious about them at this time is perfectly natural; but that the solicitude should be carried so far as to deprive the child of our care is not wise. If parents would feel the weight of responsibility under which they are placed, and act on it, their children would reap the benefits of greater care and attention than many of them receive. If they were made to understand how much pain and discomfort could be prevented and spared their little ones, for whom they would sacrifice anything, the long and wakeful nights they are sometimes compelled to pass, the money to be expended in regulating and filling, and the many other troubles that might be avoided by timely care and attention, we are sure they would thoroughly wake to their duty. Decayed, aching and dead teeth are, oftener than many imagine, the prime cause of weak eyes, ear-troubles, and headache; they may even cause deafness, blindness and other ills. Then let us endeavor to impress the important truth that prevention is better than cure.—[*Ohio State Journal.*]

ARTICLE VI.

IRREGULARITIES OF THE TEETH.

BY DR. NORMAN KINGSLEY, NEW YORK.

[Part of paper read before Dental Society of Scotland |

An observer with limited experience may often be misled by the appearance of teeth as they first erupt. They may seem to be growing out of the line of the arch, and that a permanent irregularity is inevitable; but many such cases need no interference. If left to themselves, they will approach regularity, and oftem assume their true position, unless the occlusion of the antagonizing teeth prevents them. But interference is demanded as soon after eruption as it becomes certain a deformity is inevitable There is then no longer justification for delay; for after that period every year increases the difficulties, both pathological and mechanical, and prejudices the stability of the change.

But all irregularities in the position of the teeth are not deformities which demand treatment; there are many departures from the normal type where neither the utility nor the beauty of these organs, nor the symmetry of surrounding features, is seriously affected by such malposition.

The regulation of teeth involves often the wearing of fixtures which cannot be removed and cleansed as frequently as the health of the mouth demands. Their continued presence may prevoke caries of the teeth, and a prolonged treatment may seriously impair the nervous system; therefore, regulating teeth should not be undertaken without proper consideration. Such a consideration must recognize the age, sex and family type, and the relation of the features; the cause of displacement, the constitution of the teeth, and the ravages of decay; the efficiency of the teeth, the enunciation of the voice, the risk of inflammation, and the destruction of pulps; the systemic condition and endurance of the patient; the time required, and the annoyance to which he would be subjected; the means and appliances for correction; and, finally, the character and permanency of the changes wrought.

Regulating teeth may be undertaken under favorable circumstances at any age short of full maturity; but, all things considered, the most desirable period to begin the correction of much irregularity is when the cuspids and second molars are fully erupted. The occlusion of the teeth is an important factor in determining the permanency of the change. All attempts at correction at any age will be folly, unless the antagonizing teeth on occlusion will serve to hold them in their new positions.

Success in treatment is based on the fact that the teeth are placed on the maxillæ, surrounded by vascular, elastic, bony processes, which are easily moved or absorbed under pressure, and that reproduction of bone will follow such conditions, and make the teeth solid in their new locations. The possibilities under favorable conditions, within certain limits, are almost unbounded. Narrow jaws may be widened, protruding jaws made to recede, individual teeth moved considerable distances, and teeth elongated or shortened, or twisted in their sockets. The success of skillful efforts in this direction has been triumphant.

Some of the most marked cases have been made where the face has been deformed by a protruding or receding jaw, either upper or lower. Strictly speaking, when this occurs with the upper jaw, it is not the maxilla which is at fault, but rather the whole dental arch. Such a condition in the lower jaw is more likely to rise from a mal-articulation at the joint; but in either case; when taken at the proper age, they are quite amenable to treatment.

It is possible in correcting deformities or irregularities of the dental arch, to create a deformity of the external features. It is not always advisable to attempt to change the form and expression of a mouth were the condition is an inherited peculiarity—being a part of the family type—and where the change would involve prolonged effort, possible breaking up of a good articulation, and with the knowledge that nature will be constantly making an effort to return to the inherited type. In hereditary cases of extensive character which have been delayed till at or near maturity, we can never feel certain but that the original tendency to mal-position, so long unbroken, will re-assert itself at any time we abandon retaining fixtures.

On general principles, it is desirable to retain every sound tooth in the mouth, yet there are many cases of crowded dentition where the removal of a tooth on each side of the jaw is justifiable. The retention of every tooth in the mouth is not necessary to the efficiency of the masticating apparatus, is not required to maintain the contour of the jaw, and the loss of certain teeth produces no visible external effect. Good articulation is of more importance than the full number of teeth.—*Items of Interest.*

ARTICLE VII.

THE MISSING INCISORS IN MAN—WHICH ARE THEY?

BY ANDREW WILSON, L. D. S.

The number of incisor teeth in what is called the typical dentition in placental mammalia being in each jaw six, or three pair (one central and two lateral), while that in man is normally two pair (one central and one lateral), the question I propose raising is, which of the lateral pairs has been suppressed? The answer given by the authorities on Dental Anatomy is, the outermost, *i. e.*, the third on each side. Mr. C. S. Tomes, in his manual, second edition, page 9, says:—"The human subject does not possess the third incisor . . . . so that a somewhat abrupt change of form in passing from the incisors to the canines . . . . is no more than might be anticipated." And at page 286 he gives as a general rule, "It is usually said that when incisors are missing from the full typical number, they are lost from the outer end of the series, that is to say, if there is but one incisor, it is i^1; if two, i^1 and i^2. There are many exceptions to this, *e. g.*, the first incisor is the first to disapper in the otter (?), walrus, and some others."

The first named is evidently a misprint for the Otariæ (eared seals), the number of incisors present being very varied in the different genera among the Phocidæ.

As in the superior maxilla we have the advantage of the incisor teeth being restricted to a well-defined portion, the intermaxillary, originally a distinct bone, I will, in what follows, speak of the upper incisors only.

Cases in which we find the full typical number of incisors present and of normal form in man are seemingly very rare, but cases in which, while only the normal number was present on one side, there were three on the other, are much more frequent.

These extra teeth usually follow the lateral type, but we have a model in the museum of our Society of one following the central type.

Of the first class I have only met with two (exclusive of one* in the temporary dentition), as against seven of the second class, and as in these (with two doubtful exceptions) the lateral second from the canine seemed to me the intercalated one, I have been in the habit of teaching that I considered the suppressed incisor in man to be the second, not the third, the authority of the manual notwithstanding.

This view is very materially strengthened if we include as incisors those abnormally formed teeth which so frequently show themselves in the intermaxillary portion of maxillary bones.

These almost invariably take up a position either between the normal lateral and the central incisor, or the mesial line, most frequently within the dental arch.

Looking to the forms of these teeth, we may arrange them in two groups, the first—by far the more common—are pointed conical teeth (the typical supernumerary tooth); the second are usually much larger, with very irregularly formed cutting edges, frequently broad and multi-tuberculated.

The first group I hold to be lateral incisors taking on the rudimentary form, which we find, as a rule, to precede

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*In this the teeth formed a perfect arch, and the central and second incisors were geminated, each having its own pulp cavity. The after history of this case would have been of considerable value, but the accidental death of the boy made it only partial. A second model shows that the second incisor on the right side was succeeded by a permanent one, which erupted *outside* the arch. His father (a medical lecturer) reported that a lateral had appeared on the other side in succession to the *third* temporary incisor, and that there was no appearance of a second. Still, sufficient time had not elapsed to say it might not have come; at the same time, if it had done so, it would have been out of the arch.

suppression, and which we now find not unfrequently in undoubted lateral incisors.

I may remark in passing that it is from the more frequent appearance of this form in the normal lateral, coupled with the seemingly now more frequent suppression of this tooth, that we conclude that in man there will in course of time be only the central incisors left.

Those of the second group I regard as, when large, malformed incisors of the central type, and when smaller, of the lateral; and I think a close inspection of these forms will bear me out.

Holding these opinions, I was much pleased to learn, through a paper by Professor Turner on "The Relation of the Alveolar Form of Cleft Palate to the Incisor Teeth and the Intermaxillary Bones," read before the Royal Society here in December last, that Dr. Paul Albrecht had, while investigating the anatomy of cleft palate, been led to the same decision regarding the suppressed incisors in man.

For the benefit of those members who may not have an opportunity of seeing that paper, which strongly supports Dr. Albrecht's views, I will, in conclusion, very briefly give the chief points which led Dr. Albrecht and Professor Turner to that decision.

In very much the larger number of cleft palate cases examined by them they found that the alveolar fissure, in place of being in the line of the maxillo-intermaxillary suture, that is, between the outer incisor and the canine, was to the *mesial* side of the outer incisor and so in the body of the intermaxillary bone, the maxillo-intermaxillary suture coexisting with it. Minute examinations of a large series of superior maxillæ led to the detection of traces more or less decided of an "intra-incisive" suture (in the plane of which the cleft usually occurs), and to the conclusion that originally the intermaxillary portion consisted of two bones on each side, the mesial one of which, in man, carried the socket of the central incisor, the other that of the lateral.

In those cases of cleft palate in which an extra incisor was present, its sockets was *invariably in the mesial portion* along with that of the central, showing it to be the second incisor of the typical dentition.—*London Dental Record.*

EDITORIAL, ETC.

A SINGULAR PUBLICATION.—We have recently received from a dentist practicing in South Carolina, a pamphlet with the following title: *The Dental Student*, March No. 1885, which appears to be published in one of the States north of the Ohio River. In this pamphlet, which is made up of extracts from other journals and of unconnected articles put together in the crudest manner, is one entitled "The Cummings Patent," which pretends to be the proceedings of a Committee appointed by a general meeting of the dentists of New York and Brooklyn held in 1876, to adopt measures to contest the Cummings Patent. From what we learn, this pamphlet has created the impression that steps are being taken at the present time to raise money for such a purpose, and inquiry has been made of the editor of THE AMERICAN JOURNAL OF DENTAL SCIENCE concerning this matter. Why such an article should appear at the present time is beyond our comprehension, as it relates to a matter long since disposed of. Perhaps the party whose name appears in this article as willing to receive at the time such a movement was made, as farback as 1876, the amounts to be subscribed, can throw some light on this singular emanation. We advise all who have received this pamphlet to pay no attention whatever to any apparent attempt to raise money for an object which no longer exists.

AN OMISSION.—In the preceding number of this journal, the portion of the article entitled "Symptomatic Pathology of the Mouth," through a mistake on the part of the printer, was not credited to the *Dental Practitioner* in which journal it originally appeared. We take pleasure in making this correction.

NINTH INTERNATIONAL MEDICAL CONGRESS. WASHINGTON, D. C., 1887.—*Section on Dental and Oral Surgery.*—Below appears the list of the officers of the Section on Dental and Oral Surgery of the Ninth International Medical Congress to meet in Washington, D. C. in 1887, and which has just been officially announced. The selection of such a noble body of men to represent the dentists of America reflects credit upon the judgment and foresight of the Executive committee of the Congress, and their efforts to elect gentlemen that would be representative of, and a credit to our specialty, should receive, and no doubt will, the hearty support of every dentist in the land.

The gentlemen chosen are "good men and true," and the honor of American dentistry can be safely entrusted to their keeping.

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J. W. White, M. D.,	Philadelphia.

—*The Archives of Dentistry.*

THE SUMMER SESSION OF THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MARYLAND which began in April last, has been very successful in affording more than sufficient clinical material in the form of Infirmary patients, for the class in attendance.

The advantage of such a large amount of practical instruction which the patients who frequent this Infirmary afford, cannot be overestimated, and if the author of an editorial which appeared in a late number of the *Medical Record* would pay a visit to this institution at any period during the year, he will find that "dental charity" at which he sneers, is of a different kind from that he describes, and is of a nature to compare equally with what may be termed "medical charity." The editorial referred to as appearing in the *Medical Record* is as follows:

"DENTAL CHARITY.—Dr. Roosa struck a happy note at the dinner of the Odontological Society last week, when he urged that dentistry, being such a prosperous calling should now do a little more for charity. There is no reason why a man should receive gratuitous treatment if he has a pain in the stomach, but none if he has a pain in his tooth. He can, to be sure, have his tooth pulled out without paying, but that is about the limit to which dental charity has as yet reached. The dental departments of our city dispensaries consist generally of a box of second-hand forceps, which are wielded by young amateurs with a generous indiscrimination, and with varying degrees of skill. Such kind of dental charity may be compared to a surgical charity, which is supplied simply with a saw and a knife for cutting off all bruised or injured fingers, without making any finical distinctions as to degree or kind of traumatism. There are annually in this city not far from ten thousand teeth wrenched from the poor man's mouth in the name of charity. How much discomfort, dyspepsia, and domestic troubles this produces we will not attempt to estimate. Certain it is that the teeth of the poor get a great deal less care than they ought to have, and are more abused, surgically speaking, than any other organ of the body. In the name of charity, let the poor be taught how to preserve their teeth, and let the clean mouths, at least, be given a chance to have their good members saved."

MONTHLY SUMMARY.

THE FIRST PERMANENT MOLAR.—*By J. H. Wooley.*—I am inclined to compare the first permanent molar to a waif, or outcast in the street, that is neglected through ignorance of its value. At the time when the first permanent molar is erupting, there are physical forces at work which disturb its harmonious growth. Neglect caused through ignorance of parents who think these teeth belong to the first set, plays a prominent part in their early destruction. If parents were familiar with the time these teeth usually erupt, and then placed their children in the hands of competent dentist, a large majority of the teeth could be saved. I believe it to be a mistake to remove these teeth for the purpose of correcting irregularity. Dr. Black says: "My study of the comparative liability of the teeth te decay at the different periods of life, shows clearly, that the first molars are attacked in the first two or three years after eruption, much oftener than any other teeth. But in after years they are oftener attacked less than the second molar. If the first and second molars are in a fair condition at the age of fifteen, the chances for the first are better than those of the second."

The coffer-dam should always be used in making an examination of these teeth; by this means we are better able to explore the decay. Often a slight decalcification is discovered, which can be stopped by a small filling, which, if neglected, will spread and soon involve the whole crown. My treatment of these teeth is as follows: In large cavities, where the inner surface is sensitive without pulp exposure, I fill with cement, allowing this to remain in the tooth from one to six months. I am careful first to flow over the floor of the cavity the cement in a soft condition, allow this to harden, then finish with the same material mixed very stiff. When this filling begins to show wear and the patient has had no trouble with the tooth, I partially remove the cement, leaving enough to cover the floor of the cavity, and am exceedingly careful that none of the cement is left clinging to the margins of the cavity. I then fill the remaining portion of the cavity with gold and tin combined, or whatever material seems best adapted to the case. If these teeth are taken in time, and carefully watched it will be, in most instances, the fault of the dentist, and not the teeth. if the cannot be saved.—*Ohio State Journal.*

REMOVAL OF THE DECIDUOUS TEETH.—*By Dr. O. A. Jarvis, New York.*—Nature has made provision for removal of the first set of teeth by a painless and healthy process of absorption of the roots. Almost without exception they will absorb fast enough to keep out of the way of the incoming teeth of the second set. Watchful parents are much troubled when they see the new tooth apparently crowded out of the proper line by the old one, and they want the old removed at once. This is *sometimes* necessary, but it is very seldom done except by ignorance or overpersuasion; and may result in serious and lasting injury to the patient. Even *crowding* during the growing age is accomplishing a purpose. It is positively necessary that the dentist should see the child often, and do with such teeth as he thinks best, for changes are rapidly taking place which may change the position of affairs favorably or unfavorably in a few weeks. When the natural process of absorption is not interferred with, the roots disappear, and the crown sits loosely on the gums, till it is easily removed with the fingers. This is not dying; there is no violence, disease or pain; it is simply passing peacefully away, as we ought to in good old age. But if from any cause (sometimes by accident, but generally by decay) they become dead and a source of irritation, they should be removed immediately. To retain them when nature is making such an effort to get rid of them, is unwise, and productive of much harm to the other parts.—*The Dentist.*

DEATH FROM NITROUS OXIDE GAS.—The occurrence of a death under nitrous oxide has lately caused a good deal of excitement in Paris. A retired magistrate, named Legeune, went to a M. Duchesne, a well-known advertising dentist of Paris, to have a tooth extracted. Gas was administered, and the operation performed; it was then discovered that the patient was dead. From the fact that there was no appearance of hemorrhage when the extraction took place, it is inferred that death must have occurred just prior to the operation· An examination of the body was made by Dr. Brouardel, but so far as we can learn. his report has not yet been made public. Judging, however, from the statements which appear in the French journals, death would seem to have been quite sudden, and to have been due .to syncope, or failure of the heart's action, caused by the the fear or the shock of the operation. One result of this unfortunate occurrence has been, says the Editor of the *British Medical Journal*, that a dicussion has arisen in the French papers as to the right of dental practitioners to administer anæthetics. It appears that, as a matter of strict law, only legally qualified practitioners of medicine are allowed to administer anæsthetics in France, but that this law has seldom been put in force against dental practitioners, even with reference to the use of chloroform and ether. The use of nitrous oxide is not expressly forbidden; and, owing to the general impression that it was free from danger, no question has hitherto arisen as to its use. Whether any attempt will now be made to impose restrictions remains to be seen. Another point referred to in this correspondence is one of which we have repeatedly pointed out the importance, namely, the necessity for the presence of a third party, whenever an anæsthetic is administered, to give assistance in case of accidents, and also as a witness. Cases illustrating this point have so frequently come under our notice, and we have referred to the subject so often, that we hope it is unnecessary to say more.—*Items of Interest.*

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